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**HOW TO
TURN-MARSHAL**

CAR ACTION

THE WORLD'S LEADING R/C CAR MAGAZINE

June 1993

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EDITORIAL

LOSING SIGHT

Attention all R/C enthusiasts! This is a reminder notice. Did you forget to let the cat out of the microwave? Is today "Be Kind to Doogie Day?" What what what what is it?

Don't forget why you own R/C cars and trucks—why you drive eight hours to race for 10 minutes: it's fun! Remember?

We all concentrate so much on the high-end hardware that we forget almost everything else. Take beginners, for example. When was the last time you took time out of your busy schedule to help a newcomer? Not recently, I'll bet. We're all to blame, and to some extent, so are the beginners. "How dare you place blame on those poor, helpless novices, you buffoon!" you say? Easy there, buckaroo, I'll explain.

I was at an R/C track the other day, and I conducted a little test called "spot the newcomers." Unlike a Calculus exam, this test is easy, and you won't need those pesky crib sheets. Beginners are easy to spot. They're the ones who don't seem to talk to anyone but themselves, and, if they're at a race, they almost always leave—out of sheer frustration—before their main event.

As more experienced hobbyists, we have an obligation to seek out new life forms and civilizations, to boldly tighten pinion setscrews, and to explain that, when turn marshalling, you can't stand in the middle of the track. And if you're a beginner, for God's sake, ask questions! I've seen so many novices struggle with the most basic problems: how to charge their batteries, how to glue tires, or even how to trim their car's Lexan bodies—all without tapping the resource (other, more experienced hobbyists).

The time has come to shed the "me, me, me" attitude and to reach out to others. A little time and effort on the part of the more experienced among us will ensure the growth of the hobby—just you wait and see.



It's never too soon to help your fellow racers get on the right track.

Frank Masi

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NEWS

MRC'S JUICE PAK

Words like "bigger" and "better" are often used to describe MRC's new Thunder King, Baja King and Desert Thunder. These World Scale Off-Roaders are innovative, but not just because of their size. World Scale machines are also as tough as nails, and their twin 540 motors and almost indestructible gearboxes provide them with unequalled climbing power and force. What's more, they're hot—right out of the box.

But what if you want to make them even hotter? Where do you start? Because World Scale is such a different animal, you would do well to think of modifications differently, too. Instead of experimenting with an assortment of costly motors and gear ratios, we suggest you start by going right to the battery pack—right to the MRC "Juice Pak."

Sub-C battery packs offer a lot for their size, but remember that World Scale Off-Road racers don't carry the restricting size and weight limitations of smaller vehicles, so there's no reason for World Scale's to limit their vehicles or their thinking to existing equipment. There's ample room aboard a Thunder King, Baja King, or Desert Thunder chassis to carry a battery pack composed entirely of big C-cells, whose many advantages to racers and back-yard drivers alike can be described in a single word—killer!

The MRC Juice Pak is a powerful, new C-cell battery pack designed exclusively for World Scale Off-Road trucks and buggies. MRC's Juice Pak is made up of eight C-cells—producing 9.6 volts and nearly twice the running time of a typical sub-C pack with an amazing increase in raw power and off-the-line punch. No modifications to motors, transmissions or gear ratios are necessary to take advantage of the MRC Juice Pak in a World Scale vehicle. Just plug it in and rip up the competition.

Will the MRC Juice Pak fit? Yes! Included with every new pack is a set of MRC front and rear battery mounts that takes the place of the mounts that were provided with your kit. Just remove the original mounts, put the new ones in their place, and drop the MRC Juice Pak into position. It's that simple.

And what about running the MRC Juice Pak on the track? Well, in most cases, World Scale racers won't be competing side by side with 1/10-scale off-road, so the need to follow existing battery rules is nonexistent. As it was meant to be, MRC's World Scale is in a class by itself. For more information, see your hobby dealer or call (908) 248-0730.

ADVERTISEMENT

LETTERS

WRITE TO US! We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

NITRO SWITCHAROO

Yo, what's up?! I was wondering: I saw an ad in your February '93 mag that showed how to change LX-Ts and RC10Ts into gas-powered trucks. I have an Outlaw Ultima, and my question is: can the Outlaw be turned into a gas-powered truck? And one more question: when my Outlaw takes a big jump, the shocks stay down. Is this supposed to happen?

RONNIE GRANDERSON
Riverside, CA

Well, Ronnie, I have some bad news for you. Your Outlaw can't be converted into a gas-powered truck with the DuraTrax kits you saw in the ad; they work only on the LX-T and RC10T. But there are a few other possibilities you might want to consider. The Outlaw Ultima's gaseous brother, the Rampage, shares many parts with the Ultima, so you could convert your truck to a Rampage. That would be the cheapest route. Other companies, such as Traxxas and Schumacher, make off-road, 1/10-scale gas trucks, too. Or, check out Kunio Dudgeon's handiwork; he might be able to help you out. Get in touch with him through A-Main Racing, 3731 W. 95th St., Overland Park, KS 66206; (913) 383-9481.

On to your next question. As for your shocks staying down (I assume you mean they're staying fully compressed), something is binding inside the shock bodies in a major way. Either you've never rebuilt the shocks and they're filled with toxic waste by now (causing the piston to bind against the inside of the shock body), or, quite possibly, the shock shaft is bent. Take your shocks apart and inspect all the parts. Replace

any that are worn or damaged, and refill the shocks with clean oil. With the shocks off, check the suspension-arm movement. If it binds in any way throughout the full range of motion, it's time for a quick cleaning and a rebuild. That should take care of your problems.

JH

DECISIONS, DECISIONS

I'm thinking about buying a Trinity Evolution 10, and I don't know if it's a good on-road car. If it is, which motor and body should I use? I also wanted to tell you that I'm amazed at how good your magazines are. The information in them thrashes the competition to shreds.

DAN NICOLAU
Corpus Christi, TX

As you'll know by now, Dan, the Evolution 10 (driven by Joel Johnson) won the IFMAR On-Road Worlds. It's a great car, and if you want more info on it, you can check out my review in our April '93 issue. For an in-depth look at Joel's winning car, look in the March '93 issue.

Depending on which class you'll be racing in, there are a ton of motor and body styles from which to choose. Almost any 1/10-scale on-road body will fit the Evolution 10. Check your local track to see which kinds of motor the other racers are running. That should point you in the right direction.

JH

CORRECTION!

In the April issue, we printed an incorrect phone number for Steve Whitney, ROAR Administrator. The correct number is (407) 631-5857. The address is 1203 Westview Dr., Cocoa, FL 32922; fax: (407) 633-4625.

We apologize for any inconvenience!

GRIND THOSE GEARS

I read your magazine constantly. I've been involved in R/C cars and trucks for about 10 years now. I started with Radio Shack equipment when I was six, moved my way up to a Falcon and soon bought a Blackfoot. I decided I wanted more, and I got a Kyosho USA-1. After I got it running, I enjoyed six months of off-roading, and then my front and rear gearboxes started to make weird noises. It sounds as if the pinion gear is misaligned, but I've aligned it as well as I can. The noise is a clicking, and it becomes very loud whenever I climb hills.

DOUG SCHROEDER
Chittenango, NY

Doug, tear your gearboxes apart to ensure that all the gears mesh properly. If any of them are rounded off, or are missing teeth, replace them immediately. If you've checked the gearboxes and everything seems OK, check the front and rear dogbones. The dogbones are made of a softer type of plastic and are designed to "give" a little. They might be rounded at the ends, or they could be bending or twisting. If that's the case, replace them and you'll be on your way again in the off-road scene. JH

FYI

Your article "Project RC10T" in the R/C Racing & Monster Trucks special features the ERP Worlds Chassis. ERP has gone out of business, but the Worlds chassis is still available. It's manufactured by Gisi Mfg. as the G-151T chassis, and it's distributed by Rocky Mountain R/C Mini Sports, 6401 North Broadway, Unit G, Denver, CO 80221; (303) 426-0110. It's also available from Stormer Racing, P.O. Box 126, Glasgow, MT 59230-0126; (800) 255-7223. Compliments to Mike Lee on a well-written article.

MARK GISI
Boulder, CO
(Continued on page 161)

NEW!

RC10T & RC10 OWNERS LOOK AT THIS!!!

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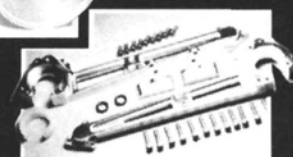


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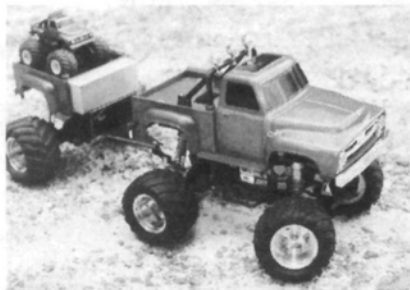
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READERS' RIDES

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to *Readers' Rides, R/C Car Action*, 251 Danbury Rd., Wilton, CT 06897. If the *Ayatollah of Radio Controlla* chooses your photo, you'll receive a 6-month subscription to *Car Action*, or an extension of your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1993. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.

RACEWAY PATROL

Kieran Au's mostly stock, nitro-powered 1/10-scale Ram-page truck is topped with a "No speeding" paint job, and it has fully functional siren lights made of disposable cigarette lighters. Kieran, who hails from Alhambra, CA, controls his truck with a KO Propo EX II pistol radio.



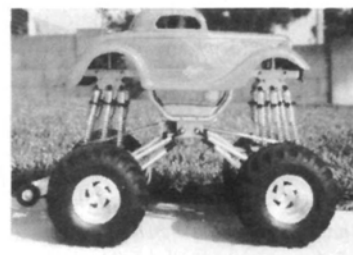
EYE CATCHER

Michael Kouma's Midnight Pumpkin is equipped with a Futaba speed controller, a Trinity 17-turn triple motor and a custom-made "pumpkin" trailer. "I race a Losi truck now, but when I take the Pumpkin to the track, it seems to get all the attention," says Michael.



LOW 'FOOT

Fred Young's Blackfoot has been modified from the ground up; in fact, the only stock part that hasn't been replaced or modified is the pin that keeps the battery in place. Fred, who lives in Bel Air, MD, races his truck in the stock class on an indoor carpet track.



BIG OL' FORD

Gary Rowan dreamed of building a full-size '33 Ford so that he could cruise the local strip, but his project ended up slightly smaller and more eccentric. Gary, from Cerritos, CA, included in his letter a list of all the modifications he has made to his Tamiya Bullhead. The only stock parts retained from the kit are the tires and gear cases.

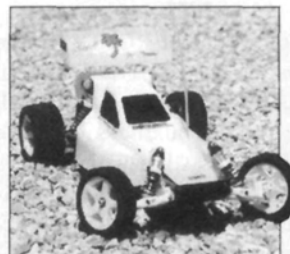
VIVACIOUS 'VETTE

George Wilkerson of Fort Worth, TX, has modified this Clod Buster. The truck has a Novak 610RV ESC, dual 427 Speedworks motors, a Futaba 9301 servo, two separate 7-cell parallel packs, a six-pack of rechargeable AA batteries for the six RAM lights, a Parma Hemi engine with a detail kit and a KO Propo radio.



STREET CRUISER

Andre Vidal's hot-looking Suzuki Samarai low rider comes from England. Based on a Tamiya Blackfoot chassis, this car is equipped with a Monster Mash motor, custom-made rim inserts, a tire cover and a genuine suede hard top. The nerf bars were made out of a dresser handle, and the chassis was modified to use seven cells.



BACK AGAIN

Al Kalafian from Horsham, PA, saw *Car Action* and was hooked. He bought an RC10. It's stock except for the Intruder body and HPI Superstar wheels with Pro-Line Stryker tires.

READERS' RIDES

KING OF CABS

"This Tamiya King Cab is the best around town," states Eric Hinkle of Durand, MI. Eric's King Cab includes goodies such as Pro-Line split-ribbed front tires, DuraTrax competition shocks and diamond-spike rear tires. A Novak ESC and a Speedworks 427 motor send the truck on its way.



NITRO BIGFOOT

From Covington, KY, Daron Dyer's Nitro Crusher has taken a break from being a USA 1 and switched over to a Bigfoot version. Daron's truck has full ball bearings, and it runs on an O.S. RF-B engine (15 percent nitro) with a DuraTrax pipe. A Futaba 2PD radio controls the brute.



NASTY NASCAR

James Hammond, from Roger-ville, AL, has tricked-out his Bolink LTO SS with T/M Pro Cap radials, a Futaba PCM radio system and a Tekin ESC. James races his NASCAR replica at the Spring Cove Speedway—a 360-foot concrete tri-oval.



SAND SLINGER

Jim Greenleaf, who lives near the Oregon Dunes National Recreation area, built an RC10 Team Car that can climb the steep dunes. The car has rear sand paddles, a DuraTrax Powerline motor, a Futaba MC112B ESC and HPI Super Star rims with full-rib front tires.

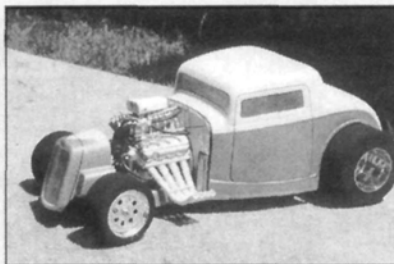


FIRST TIME LX-T

This sharp-looking LX-T comes from David D. Bazemore of Fayetteville, NC. The truck is equipped with a Warlock Outlaw stock motor, a B&T Blister pack, a DuraTrax ESC and Airtronics radio gear. This LX-T is David's first kit, and he painted the body himself.

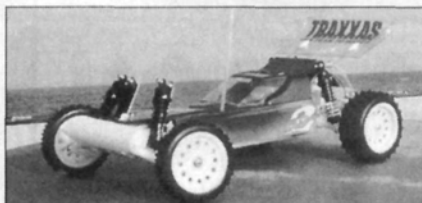
SUPER COUPE

David Jenkins of Columbus, OH, sent his Parma Hemi Coupe, which is powered by a B&R Bullet motor and a Futaba 112B ESC. David painted the body and certain motor sections. He thanks Jeff "The Hobby God" Kehoe of Twentieth Century Hobbies, for getting him started with R/C cars.



BEFORE AND AFTER

This comes from Norman Skinner of Manchester, NH. The first photo was taken before the car was ever run, and the second photo was...well, you get the picture. Norman's Traxxas Rad 2 is equipped with a Novak 410 M5 ESC and Futaba radio gear.





INSIDE SCOOP



by CHRIS CHIANELLI

IN SEARCH OF FUN AND GLORY, 'CAUSE LIFE'S TOO SHORT TO BE A SHEEP!

Build it up



Dial it in

Associated has combined the race-winning prowess of its World Champion RC12LW with the incredible adjustability of its new front-suspension system to create the all-new RC12LS. The LS affords a near-infinite amount of geometry settings to tailor its handling to any track conditions. Camber and caster changes are quick and easy, and you can even set the caster to change during suspension travel for better cornering. The Associated 12L is more versatile than ever!

Wise up! Charge Smart!

Pro-Tech's new Smart Chargers (Autopeak AC/DC 708 and 709) are inexpensive and loaded with features. Check them out: AC 120V input cord, DC 12V input alligator-clip adapter, charger output cord with connector, two-way universal output jacks, DC 12V input sockets, fuse holder, current adjustment, and fast-charge and trickle-charge indicator lights, just to name a few. Watch for them.



For more information contact: Model Craft MFG, 45555 W. Pico Blvd., Los Angeles, CA 90019; (213) 462-2437



Turn left. Look wild!

B&R Racing has released this wild-looking 1/10-scale super-modified oval car. The basic kit uses Associated 10L and other readily available parts. A rolling-chassis version is also available. This realistic-looking machine is designed to go fast while turning left. For more information, contact B&R Racing Chassis, 9952 W. 82nd Place, Arvada, CO 80005; (303) 467-2579.

These new 64-pitch pinions from Magic Motor Sports feature high concentricity and have an ultra-hard coating that lasts longer, even under hard use with modified motors. Their super-low mass and precision machining improves performance all around. Personally, I believe these pinions reduce the unwanted—and highly disputed—gyroscopic-inertia factor. This theory has yet to be proven, but mark my words; it will be.

Zero Gravity Gears

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Linden, NJ 07036;
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Pro-Line has teamed up with JACO to bring you JACO Racing Foams. The combined experience of these two well-known companies offers the on-road racer an affordable, yet competitive foam tire. JACO Racing Foams are compounds of low-wear/high-traction rubber wrapped around rigid, lightweight performance wheels that are constructed of composite materials. It sounds like a winning combination from a winning team. We'll be putting them to the test ourselves.

Pro-Line + JACO Victory





It's Showtime!

Achtung! It's showtime in Deutschland once again—the International Toy und Hobby show in Nürnberg. This place is unbelievable! Acres of buildings are jammed with hobbies, toys and beautiful women from all over the world. I'd stay here all year if they'd let me. Here's a sneak peek at some of the high-lights. Wer ist mein R/C schnitzel!....



Tamiya's New Hauler

Displayed in the Tamiya booth for all to see was the prototype of this beautiful 1/14-scale American 18-wheeler. The cab features a 3-speed, shift-on-the-fly transmission and a complete working electrical system featuring headlights, driving lights, emergency flashers, turn signals, back-up lights and warning sound. Obviously, the USA's love affair with the 18-wheeler will make this one a blockbuster. The highly animated Dave Baldwin (Tamiya Foreign Division) poses with the truck. Dave's personality is as bright as those high beams. Availability date for this rig has not yet been set. At left is a shot of the

Tamiya 1/10-scale, 4WD Ford Escort.



Nitro at Nürnberg

This year, more nitro-burners showed up than ever before. There were five new ready-to-roar gas cars from Panda.

This is the new 1/10-scale 4WD Mitsubishi Pajero Rally Car, which has three diffs and a pull-starter Magnum Pro .12 BXL. Its other features include aluminum shocks, chassis and upper radio plate, beveled-gear diffs and an expansion-chamber muffler. Watch the pages of *Car Action* for news of availability.



Panther 8x8

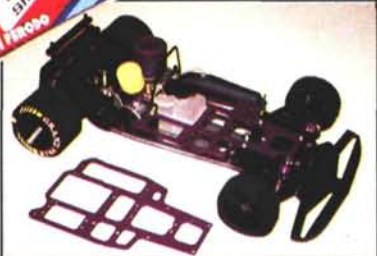
The Robbe Panther is a 1/16-scale, 30-inch-long airport fire engine with optional 8W drive. This highly detailed model can be operated with a simple 2-channel system



or, if your budget allows, you can go wild with a multi-channel radio that will operate special functions like: functional, roof-mounted nozzle; four-diff 8W drive system; diesel engine; air-horn sound modules; and scale lighting—flashers, brake lights, headlamp and back-up lamp. For more information, contact Robbe Model Sports Inc. 170 Township Line Rd., Belle Mead, NJ 08502; (908) 359-2115.

Novak in Nürnberg

Novak is just one of the American manufacturers that have gained wide acceptance on the European scene. Novak has been setting up shop at the Nürnberg show for many years now, and Bob Novak (left) says the trip has always been well worth the trouble. Plus, the skiing in the Austrian Alps is great! On the right is Novak's International Sales Manager, Martin Magdaleno.

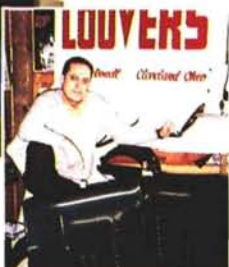


Purple Serpent

The nitro-burning Serpent Impact—which, by the way, has been doing quite well here in the States for more than a year—now has many new parts, such as this purple-anodized T6 aluminum radio plate and automatic 2-speed transmission (not shown)—just to name a couple. Watch for Impact updates and hop-ups in *Car Action*.

American Success Story at Nürnberg

Back in the '60s, Ken MacDowell (president of Parma International) would tow his louver-stamping machine to races, cashing in on post-race spectator excitement. Ken stamped louvers into people's hoods as they left the race; buyers were convinced it made their cars faster. That's Ken with the original louver machine, which he recently hunted down and bought again. The other photo is of the beautiful Parma booth at Nürnberg—a testament to the highly successful world market Parma has captured. From traveling louver man to world marketer. Obviously, Ken's hard work has paid off.



Kyosho Creativity

The Kyosho booth at Nürnberg is always a hot spot. This prolific producer never fails to have interesting offerings, such as this low-fuel warning light. Also shown is this new 2WD gas-powered car which appears to be a Nitro Raider—maybe? I'll find out for sure; don't you worry.



Yokomo F-40

Mr. M. Morita-san (Yokomo's Manager, International Division) was kind enough to let me take a spy-shot of the new glow-powered, pull-start Ferrari F-40. Can't tell you much about this one yet other than the fact that it features the usual high-quality Yokomo treatment with such things as aluminum chassis and fully independent suspension with aluminum oil-filled coil-over shocks. Stay tuned for more.



MARSHAL ARTS

by JOHN THAWLEY

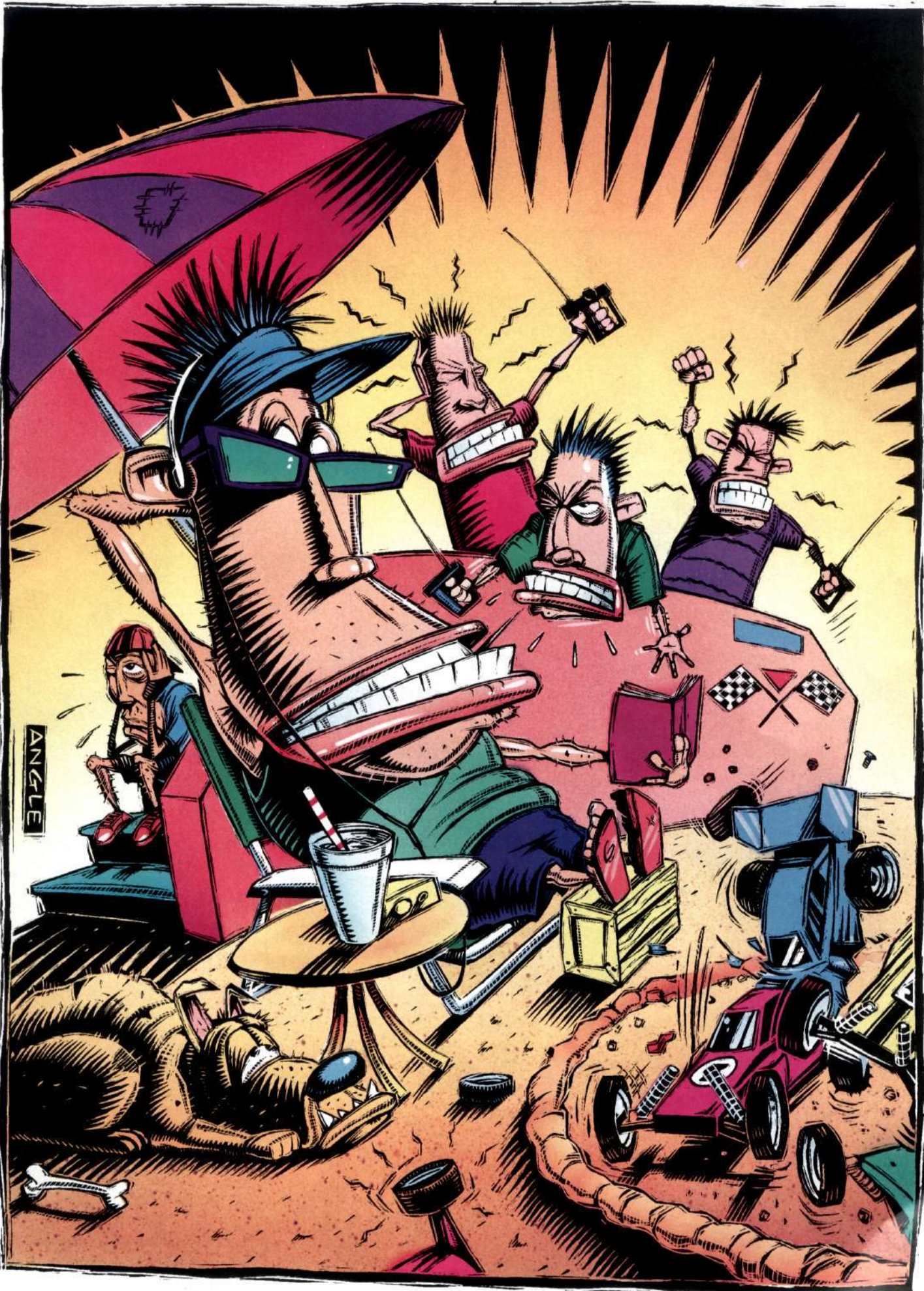
GEEZ! I CAN'T believe I'm being held up by Johnson and Hirosaka. C'mon, guys, let me go. This is a career drive I'm on. I'll just power by them on the straightaway. Yeah! That's the ticket. I'll just power by them and give them a look at the rear end of my homemade...MARSHAL! Hey! Hey! Yo, marshal! You idiot! Why don't you pay attention to your corner?

How to **TURN-** Marshal

You've done it. You know you have. You've been caught daydreaming about that career drive, or griping to yourself

about how the guy in your heat took you out. All of a sudden, some screaming soul—whose JRXRC10BluePredatorLTO is parked nose-in at the boards—reminds you very loudly that you're supposed to be marshalling. How much do you hate it? Well, humble up, guys. We've all done it. But if you're an R/C racer, marshalling is part of the game. Here are some tips that will help you do it better.

First, get your head on straight! Quit copping an attitude about having to marshal. It's not going to kill you to take your turn. Believe me. I've directed more than 25 national championships, two world championships and hundreds—maybe thousands—of club races, and I've never seen anyone killed in the act of marshalling. (I have, however, seen a few come close to being killed for the act of *not* marshalling.)



ANGLE

HOW TO TURN-MARSHAL

THE TEN COMMANDMENTS OF MARSHALLING

After you've completed your heat, go directly to your marshalling position. Race directors hate to call for marshals. Believe me, it's a drag. You know you're going to have to do it, so just do it. Stay out of the pits! If you go into the pits, the next thing you know, you'll be working on your car, talking to your buddies, or even signing autographs. Forget all that. You have a job to do. Go directly to the track and marshal!

When you approach your marshalling position (assuming you haven't already scoped out the most inactive spot on the track), consider the view from the drivers' stand. In other words, make sure that you aren't in the way. A lot of you guys haven't been watching your Cindy Crawford exercise video. Well, OK, maybe you have been watching it, but that alone won't slim you down. Anyway, don't block the view.

Once you've assumed the position, pay attention. There's nothing worse than crashing in front of a marshal who has gone comatose. Well, wait a minute. I guess crashing in front of some buffoon who's chit-chatting with his friend about getting taken out in the last heat could yank on your Jockey shorts just a tad. Oh yeah, then there's the guy who's watching the leaders as if he were watching "Gilligan's Island" reruns. Either way, there's nothing worse than marshals who don't watch their corners. Pay attention!

Flashback: PC Hobbies/King Super-speedway, 1990 ROAR Oval Nats. A former employee of the R.J. Reynolds tobacco company, after being dismissed for health reasons (black lung), takes up R/C racing. Unfortunately, while marshalling in the high banks between turns three and four, this young man was struck down by seven charging electric stock cars. It seems that he had spilled an entire pack of cigarettes while he straightened out two cars that had collided in front of him, and he immediately took on the appearance of a scrambling Girl Scout playing jacks. Unaware of the oncoming traffic (I think this guy was unaware of daylight), he suffered multiple Lexan lacerations across many of his limbs and his somewhat important lower extremities.

In electric racing, marshalling requires either 4 or 8 minutes of your "oh-so-precious" time. Do you think you'll live if you wait to have a cigarette? Do you think that the soda companies will collapse if you don't suck on a can for 4 minutes? Will your mouth and other

bodily functions lock up if you hold off on that candy bar? Yeah! You know who you are! When you're marshalling, you won't be able to eat, drink, or smoke for 4 or 8 minutes.

When an accident occurs in front of you, act like you know what you're doing. Like crossing any street, look before you leap. Whoa! Let me take that back. *Do not leap!* Flying marshals aren't the ticket. Keep your feet on the ground! I'm not kidding here. Don't jump up in the air. When your feet leave the ground, something can mysteriously end up underneath them. There's no room for acrobatics.

The operative word: *think!* The cars on the track have the right of way. When traffic is clear, retrieve the crashed car or cars. When you set the car back on the track, make sure you point it in the right direction and not in front of oncoming traffic. Think about these things as you approach the car.

When you retrieve a car, grab it firmly in your hands. Don't use your feet. Don't try to give it a fancy slip of the wrist, or your classic forward/reverse backhand spin. Grab it like you mean it! If the car is in a corner, don't put it back in the corner to be smacked around all over again. Move it to the exit of the corner and close to the inside of the lane. This way, oncoming traffic can pass safely on the outside while the offending car gets back underway. And don't grab on-road cars by the rollover antenna! One of three things will happen: the car will spin around, you'll pull the antenna out, or the driver will scream at you.

If you have to cross a lane to get to a car, squat down so that you don't block the view of the drivers on the stand. Stay down and close to a board until

you can exit the track safely. Forget about drivers yelling at you from the stand. Pay attention to what you're doing. A good race director recognizes a marshal who knows what he's doing and will probably reprimand the driver who has the offensive mouth.

You also need to think about marshalling when you're driving. Give the marshals a break! Don't be one of those guys who screams "marshal!" before the car even lands. Where do these guys come from? Please, fellas, get a grip. Think about what my good friend Gary Kyes from Team Losi says: "When spectators are watching a race, and they see a car crash or get stuck, they have no idea who's driving the car. That is, until the driver starts yelling and screaming at the marshal." Good point. Think about it. ■

I
Marshal with a good attitude.

Marshal for others as you'd have them marshal for you.

II
After your heat, go directly to your marshalling position.

III
No eating, drinking, smoking, or visiting with friends.

IV
Look both ways before you step onto the track.

V
Keep your feet on the ground.

VI
Grab the cars firmly with your hands.

VII
Return the cars safely to the racing surface.

VIII
Be sure not to block the view from the drivers' stand.

IX
Pay attention to your corner.

X
When you're driving, be quiet and let the marshals do their job.

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ASSOCIATED ELECTRICS

RC10 Team Truck Body

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Part no.—6130; price—\$18.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342



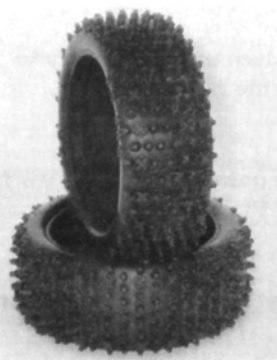
OFNA RACING

X-Pattern Spike Tires

OFNA's long-wearing, 1/8-scale tires are made of a natural-rubber compound. They come in two grades—medium and hard—and have a medium spike with an "X" design. They work well on damp or dry tracks.

Part no.—FR-3A; price—\$16.95.

OFNA Racing, 22600-D Lambert St., Ste. 1009, Lake Forest, CA 92630; (714) 586-2910.



BOLINK R/C CARS

Excel Series Tires

Bolink's new foam tires are mounted on an all-new, state-of-the-art, rigid wheel with an improved gluing process; then they're precision-trued until they're race-ready! They're available in black, blue, green and yellow compounds.

Prices—\$14.95 to \$31.95

Bolink R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245; (404) 963-0252.



TAMIYA Blackfoot QD

The most popular R/C truck ever made is now available as an easy-to-assemble Quick Drive. This 1/14-scale crusher comes almost ready to run. Just screw on the body, snap on the rear bumper, install the batteries and it's ready to roar. It comes with a high-powered electric motor, 115mm-diameter semi-pneumatic tires and a pistol-grip 2-channel transmitter with proportional steering. Tamiya offers many hop-up parts, e.g., ball bearings and oil-filled shocks.

Part no.—46016.

Tamiya America, 2 Orion, Aliso Viejo, CA 92656-4200; (714) 362-2240.



VANTAGE ENGINEERING

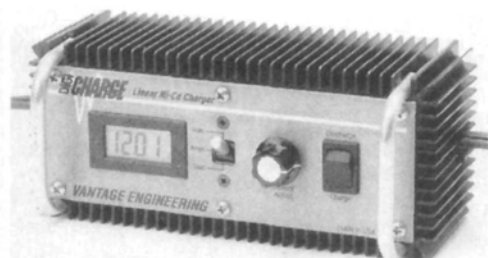
Digi-Charge

The Digi-Charge offers a tightly controlled, constant-current linear charge at any rate from 0 to 9 amps, and it monitors voltage as charging takes place. A unique peak-detection circuit pre-

vents false peaking during the first minutes of charging and is sensitive enough to prevent overcharging when the peak has been reached. The Digi-Charge also has a battery-stabilizing discharge circuit that lets you monitor discharge current and voltage. Vantage also offers the Digi-Charge Plus, which has a 10A discharge circuit.

Part no.—DC100; price—\$179.

Vantage Engineering, 681 Main St., Waltham, MA 02154; (617) 894-8694.



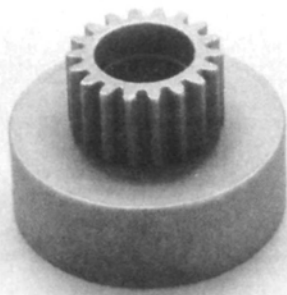
TRAXXAS

18-Tooth Steel Clutch Bell

This smaller, hardened-steel clutch bell for the Traxxas Nitro Hawk provides a lower gear ratio than the stock 20-tooth gear. The lower gearing is best for tight off-road tracks. It significantly improves bottom-end acceleration—more punch between turns! Hardened steel lasts as much as five times longer than the stock clutch-bell gear. The clutch bell requires two 5x10mm ball bearings (sold separately).

Part no.—3118; price—\$20.

Traxxas Corp., 12150 Shiloh Rd. #120, Dallas, TX 75228; (214) 613-3300.



DAHM'S RACING BODIES



D198 COMMANDO XL™ Fits LXT, Stadium Blitzzer, Blue Eagle, Outlaw Ultima, Outlaw Rampage & RC10T

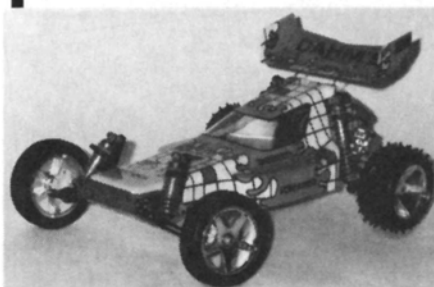
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most off-road tracks, but on hard, slick tracks, try the no. 1.

Part no.—7327.

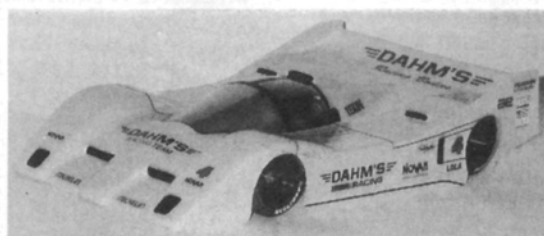
RPM, 14978 Sierra Bonita Lane, Chino, CA 91710; (909) 393-0366.

BOCA BEARING Midas Touch

This new, state-of-the-art lubricant is available in two formulas: Air Power for car, truck, airplane and helicopter engines, and Marine Power for boat engines. It reduces friction and allows cooler running, so your engine lasts longer and performs better, and you save on the cost of repairs and replacements. Midas Touch reacts electrochemically to fill microscopic pits in the surface of the engine bearings and leave them smooth and friction-free.

Prices—\$5.95/1 ounce; \$12.95/4 ounces.

Boca Bearing Co., 7040 W. Palmetto Park Rd., Suite 2304, Boca Raton, FL 33433; (407) 998-0004.



DAHMS RACING BODIES

Lola GT T92/10 Body

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Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316.

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Part nos.—7041 (complete kit); 7042 (oil spray only); 7043 (cleaner only); prices—\$12.95; \$6.95; \$7.95.

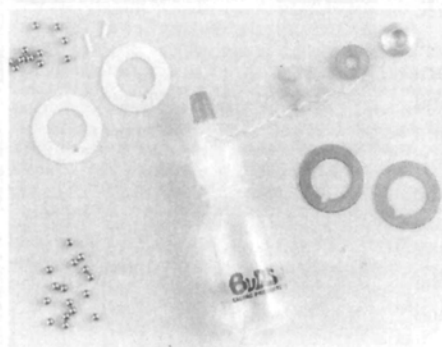
Racer's Choice, 6N258 Acacia Ln., Medinah, IL 60157; (708) 980-4863.



BUD'S RACING PRODUCTS

Ball Diff Parts

Bud's has the ball differential parts for you! From the super-popular diff thrust-cone kit to space-age ceramic diff rings, Bud's offers a smooth, durable diff setup. Available parts include: pinned drive-ring kit; replacement pinned-type drive rings; space-age ceramic drive-ring kit; grade 5 precision diff



balls; diff thrust-cone kit; silicone lube; high-pressure, thick lube for diff damper-disk kingpins.

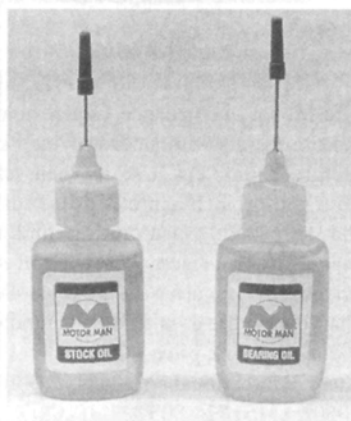
Bud's Racing Products, 1575 Lowell St., Dept. RCCA, Elyria, OH 44035; (216) 284-0270.

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Part nos.—OILS; OILM; price—\$4.95.

Motor Man, Hobby Warehouse of Sacramento, 8950 Osage Ave., Sacramento, CA 95828; (916) 381-7589.



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Return to: Track Directory, R/C Car Action,
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WHAT'S NEW

PSE

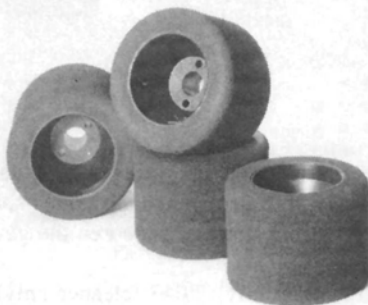
Blue Star Tires

PSE introduces its new 1/12-scale foam-rubber rear donuts for car-pet racing. They're also available mounted and trued.

Part nos. 86067 (donuts); 86167 (mounted and trued).

Prices—\$12; \$18.

PSE, 13927 Progress Pky., North Royalton, OH 44133; (216) 237-8650.



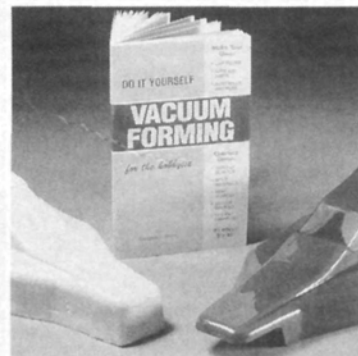
VACUUM FORM

Vacuum Forming Book

This is the most comprehensive book on vacu-forming ever published. Learn about other high-vacuum sources and how to combine them with a vacuum cleaner by using a \$5 part from the hardware store. You'll be able to obtain the high flow and high vacuum needed to form plastics of thicknesses up to 3/16 inch and even trickier Lexan parts. The book includes plenty of photos, tips and examples.

Price—\$9.95 (plus postage).

Vacuum Form, 272R Morganhill Dr., Lake Orion, MI 48360; (800) 737-3000.



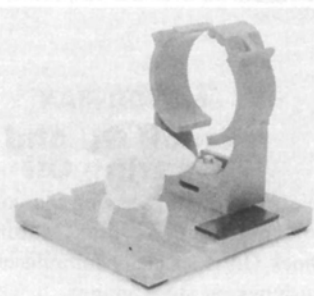
CLASS RECREATIONAL PRODUCTS

Motor Maintenance Center

The Motor Maintenance Center holds your motor securely without destroying its manufacturer's emblem. Use it when servicing your motor. It has molded-in brush slots that help with brush-cutting, and a small magnetic clip keeps screws and springs organized. It comes with the Class Turbo Prop—a small fan that fits on the motor shaft during break-in to keep the motor cool for best performance.

Part no.—6000; price—\$16.95.

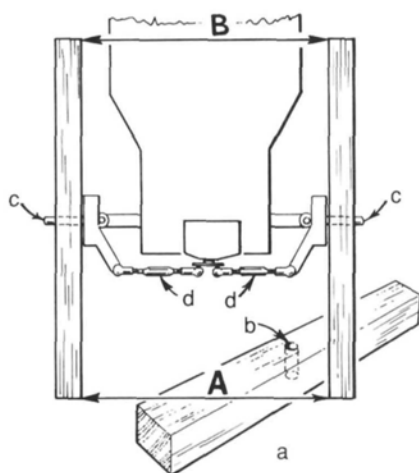
Class Recreational Products, RD 1, Box 187A, Cosby Manor Rd., Utica, NY 13502; (315) 724-8052.



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PIT TIPS

by JIM NEWMAN



TOE-IN JIG

Two pieces of maple stock (a) (from a hobby store or a lumber yard) are drilled through the center (b) to fit tightly on the axle shafts (c). By measuring distances A and B and adjusting the turnbuckles (d), you can set the front-wheel toe-in according to factory specifications.

Jim Laptewicz, Augusta, ME



IMPROVED CLEANING BRUSH

By trimming the bristles of a stiff 1/2-inch wide paintbrush as shown, you can use it to remove dirt from hard-to-reach places inside your car.

David Arguello, McFarland, CA



RIGID BATTERY PACKS

When you pack batteries side by side, pour baking soda between cells; then apply one or two drops of CA glue. It sets solid and makes a nice rigid pack.

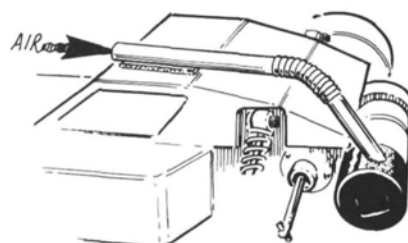
Jason Matishuk, Tolstoi, Manitoba, Canada



ESC EZ-FIT PLUGS

The rubber plugs that are used on the trim potentiometers of some ESCs can be difficult to replace. Try pressing a ball of poster putty into each hole. It stays in place, and yet it's also easy to remove.

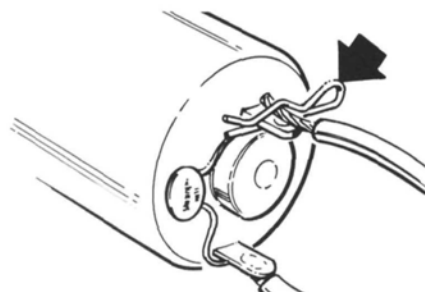
Doug Young, Chico, CA



MOTOR-COOLING DUCT

If it's equipped with a rubber endbell cover, little cooling air can move through your motor. To correct this, pierce the cover and force-fit one end of a bendable drinking straw into the hole. Then, secure the other end of the straw to the roof with double-sided tape. This will allow cool air to blast onto the motor's hottest spot—the commutator.

Brian Jonas, Germantown, NY



BROKEN-WIRE FIX

When the wire soldered to your car's motor breaks off, this emergency repair will keep you going until you can return to the shop. Strip back a little of the wire's insulation; then, use a body clip to clamp the wire to the terminal. Be sure that the clip doesn't touch any other metal part that might cause a short and damage your electronics.

Brandon Haggas, Papillion, NE

PLEASE NOTE: be sure to print your name and full address clearly on every letter and sketch you send to "Pit Tips." We have to throw away many good tips because we don't have the senders' names or addresses.

HOME-BUILT PROJECT

1/4 MILE TERRORS

PROCTOR'S GAMBLE

A FEW YEARS AGO, Ed Proctor was driving in his hometown of Wyndmoor, PA, when he suddenly hit an ice patch and lost control of his car. The vehicle spun around and slammed into a telephone pole. Unfortunately, the accident forced Ed to stay home from work for a week to recover from injuries. He spent this time browsing through magazines, and an article in *Car Action* prompted him to buy a Tamiya Clod



Ed Proctor is the driving force behind these magnificent machines, and here's a sneak peek at Ed's altered Dragster, which will be featured in an upcoming issue.



Buster—an investment that kept him occupied for the rest of his recovery.

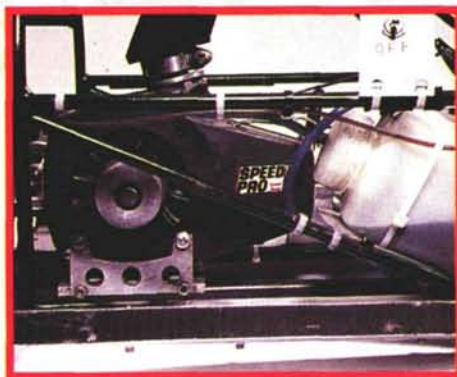
Once he was up and around and able to spend more time behind the R/C wheel, Ed tired of constantly charging batteries. He returned to the pages of *Car Action* and spotted an ad that displayed 1/4-scale gas-powered cars.



QUARTER PAVEMENT POUNDER

Ed's first 1/4-scale purchase was an old Pacesetter Funny Car with a Quadra* 50cc engine. This \$800 vehicle was already three-quarters assembled, so it didn't take long for him to get the car up and running out on the pavement; and after scouting out a few parking lots, he was ready to run.

Ed's WCM 1/4-scale Pro-Stock drag car houses a 35cc Petco engine. An advanced timing unit quickly increases its rpm for better holeshots off the line.



Driver's view: the Funny Car's cockpit was provided by Sentry Race Cars, and the driver is none other than that wall crawler, Spiderman. Spidey's feet rest on a 54cc Solo engine.

PHOTOS BY WALTER SODAS

Ed—who used to race a full-size '69 Mustang—learned from Frank DeSimone of New Era Models* that 1/4-scale drag-car races were held at Atco Raceway in nearby Atco, NJ, and he decided to give R/C drag racing a shot.

After his first race in May '90—a great learning experience—he decided to join the SDRA (Scale Drag Racing Association), which was responsible for running the races at Atco during the '90 racing season.

Midway through this season, Ed bought his next car—a WCM* Holeshot Pro-Stock car that had a 35cc engine and was equipped with a 2-speed transmission and hydraulic brakes—but he sold it to work on other projects. By the end of the summer, he had become very interested in 1/4-scale drag cars.

The following winter, he talked to Bill Horne and his son—owners of Sentry Race Cars, which specializes in building, repairing and modifying full-size drag cars. Ed and the Hornes—who also tinker with 1/4-scale drag cars—used salvaged parts from the original Pacesetter to build the totally trick Funny Car.

The Funny Car was developed from a set of full-size blueprints that the Hornes reduced to 1/4 scale. Ed made the frame of chrome/moly tubing and incorporated a set of hydraulic brakes. He also added an updated Skellenger* rear end and removed the old Quadra 50cc engine. A 54cc Solo engine with a modified high-volume carburetor was his powerplant of choice.

The carburetor was modified with flexible tubing that runs to a specialized open fitting on the crankcase. When the engine turns over, the crankcase is pressurized and releases air through the tubing. This process forces more fuel to enter the carburetor—and, in turn, the cylinder—to give the engine more fuel to burn and power to run.

Ed's custom head-er is made of a cut aluminum tube that's angled to fit tightly around the engine. But, as he's quick to point out, it's only for show. For more efficient fuel burning, he attached a 5-inch straight pipe that allows the exhaust to leave the cylinder. Remember: it's not the appearance, but the *speed* of your car that's important! Seconds count—mere *fractions* of seconds count when you're drag racing. Ed's Funny Car currently gets down the scale quartermile in the high 4-second range.

The car has a unique feature—electric reverse! From New Era Models, reverse is provided by an electric motor installed near the drive shaft. After a quick burnout, Ed flips a radio switch that causes the motor's gear to engage a counter gear on the drive shaft, and the car heads back to the staging area.

Unfortunately, 1/4-scale cars are notorious for the softness of their



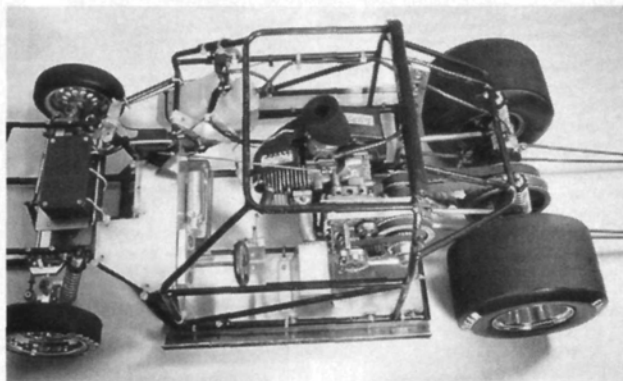
Ed calls his entire R/C collection "Proctor's Gamble"—a name lifted from his family's boat. The decals are from WCM.

wheels. Ed improved his car with a beautiful set of three-piece, custom-made, 7075 solid-stock aluminum wheels from Rick's R/C in Hawthorne, CA. The front tires are WCM rubber tires for a '34 coupe, and the rears are New Era Models' foam-filled, 9-inch-diameter, rubber-coated drag tires. The nice feature about the New Era drag tires is that the rubber outer belt can be pulled off when it wears out, and a brand-new one can be glued in its place; this saves money in the long run.

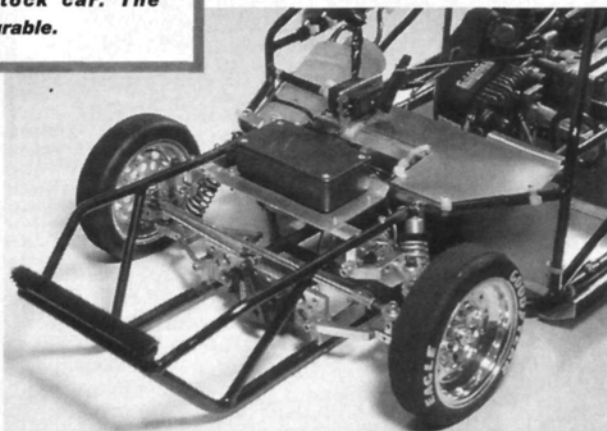
The fiberglass Oldsmobile Funny Car body is from MK Engineering*. Sentry Race Cars furnished the rear wing and parachute additions as well as a body stand, a

one-wheel wheelie bar and a customized interior—featuring a full dashboard with gauges and a steering wheel. One of Ed's friends provided the interior's fire extinguishers, and Ken Leslie of L&S Enterprises of Jacksonville, AZ, gave the car a stunning paint job.

Ed needed a driver to complete the package, and he found it—a Spiderman doll—at a local Toys "R" Us. Well, we're sorry to say that Spidey had to lose his head, but an MK Engineering plastic hel-



Here's an overview of the WCM Pro-Stock car. The chrome/moly frame is extremely strong and durable.



Notice the skinny front drag-racing tires, mounted on Tecnacraft aluminum wheels.

1/4-MILE TERRORS

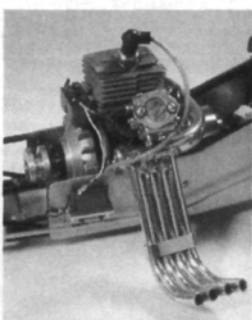
met replaced it. The helmet is complemented by a racing uniform that one of Ed's friends created for him.

PRO-STOCK FEVER

When the Funny Car was complete, Ed moved on to his next project—a WCM Pro-Stock car powered by a 35cc Petco engine with an advanced timing unit that enables the engine to quickly increase its rpm.

This car—which Ed bought from a fellow enthusiast in Illinois in '91—was modified with a third speed gear from Quarter Scale Connection. The third gear is an add-on that's attached to the axle and runs off a centrifugal clutch. When it shifts into second, roughly 25 to 30 feet from the starting line, the car's front wheels actually lift off the ground; the same lift occurs during the shift from second to third. According to Ed, during the first year he had the car, it was so fast that no one could touch it. It still sets incredibly fast times of low 6's in the quartermile.

Except for a few minor modifications, Ed's WCM car is relatively



A 54cc Solo engine with a specially modified carburetor powers Ed's Funny Car down the 1/4-scale quartermile in the high 4-second range.

stock. It has a chrome/moly chassis and WCM oil-filled shocks. It still uses the stock four-link rear suspension, hydraulic brakes and 8-inch-diameter, 4-inch-wide rear drag tires. The aluminum wheels, however, were produced by Tecnacraft*.

Sentry Race Cars provided the interior of the Pro-Stock—the dashboard with steering wheel and gauges and the lightning-rod shifter—as well as the rear wing and two-wheel wheelie bar. The WCM ABS plastic Oldsmobile Pro-Stock body was painted by Ken Leslie.

In early '92, Ed formed the Mid-East R/C Club whose home track is Atco Raceway. That summer, Ed won the Pro-Stock division at the Tri-State

Racing Association's points meet; he also took first place in his division at the '92 WRAM show in White Plains, NY.

Ed thanks the following people for their help with his projects: his wife, Robin; his mother, Dorothy; Sentry Race Cars; WCM; L&S Enterprises; Skellenger Engineering; Rick's R/C's; MK Engineering; Quarter Scale Connection; New Era Models; Chestnut Hill Hobbies;

Hobby Works; and Fine Design*.

Those who are interested in joining or receiving information about Ed's club or in getting started in 1/4-scale drag racing can contact him at 7809 Louise Lane, Wyndmoor, PA 19118; (215) 836-5476. If you happen to live near the Chesapeake Industrial Park off Route 40 in Delaware, where Ed and a few others usually run their cars on Sundays, go and check it out. You won't be disappointed!

**Here are the addresses of the companies mentioned in this article:*

Quadra-Aerrow Inc.,

P.O. Box 183,

Perth, Ontario,

Canada K7H 3E3.

New Era Models,

P.O. Box 7378,

Nashua, NH 03060-7378

WCM Corp.,

Rt. 2, Box 207A,

Buffalo,

TX 75831.

Skellenger Engineering,

2329 South Otis,

Santa Ana, CA 92704.

MK Engineering,

P.O. Box 216,

Seymour, CT 06483.

Tecnacraft, 1335E Dayton

St., Salinas, CA 93901.

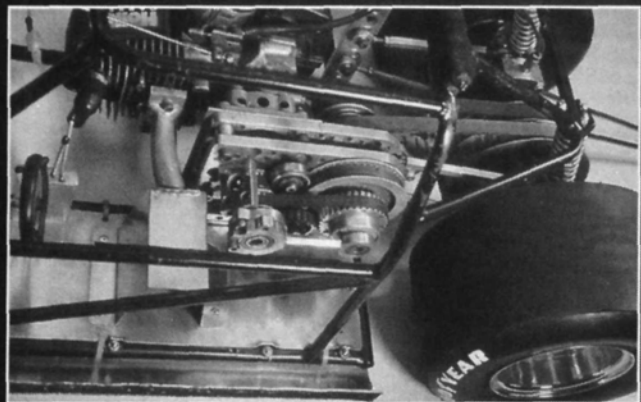
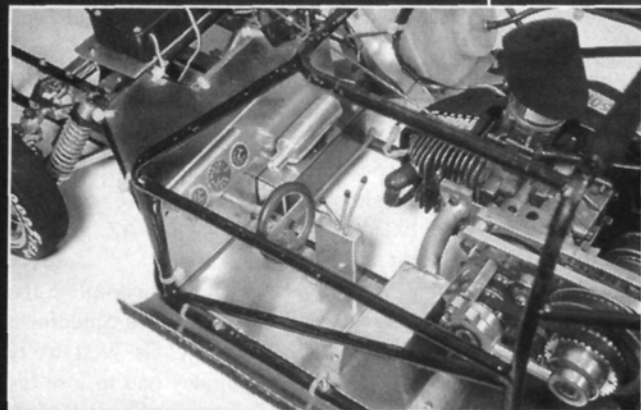
Fine Design &

Manufacturing,

2 North St., Middletown,

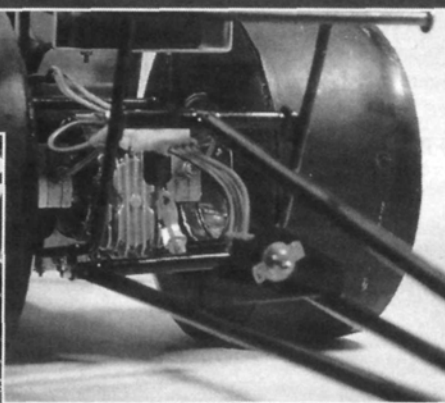
NY 10940. ■

Right: the Funny Car's Skellenger rear end allows quick, easy gear changes. Wires that hang off the back act as a kill switch to cut the motor and battery pack simultaneously.



Top: a fully detailed driver's cockpit was provided by Sentry Race Cars.

Above: check out the centrifugal clutch action! The car starts off the line in first gear, shifts into second after 25 to 30 feet, and then catches third halfway down the track. According to Ed, each time it shifts, the front end lifts up.



WCM '34 coupe rubber front tires are mounted on a set of custom-made 7075 aluminum wheels provided by Rick's R/C in Hawthorne, CA.

by MIKE LEE

CONSIDERING ALL THE great cars that are available to R/C drivers, you might think that it wouldn't be necessary to modify

cars. After all, there has never been a shortage of new cars!

Usually, the latest cars are the best ever made, and there lies the reason for competition: the top car earns the top sales.

Well, the struggle for a competitive edge is what drives a person

to invent something new and better.

That person starts to analyze the car and how it works. He studies the movement of the car and understands the reasoning behind its design. And then, he leaps off the far end of a pier, and modifies a perfectly good design with the hope of making it better. That's what I did with the subject of this review: the Cheetah Racing*

Telesis I oval-car conversion for the Associated* RC10L SS.

Car Action
TRACK REPORT



faster feline



Cheetah **Telesis** **OVAL CONVERSION KIT**



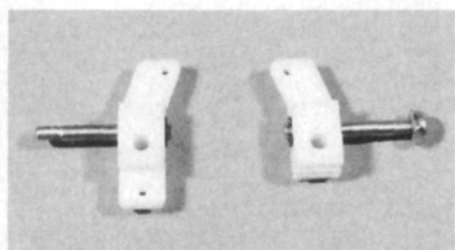
The Telesis kit contains an Ultimate Front End, a Pro Flex rear end and the chassis and its components.

IMPROVING AN OLD FRIEND

The Telesis conversion kit is almost a complete car in itself; it requires only a few parts of the original RC10L SS chassis. The conversion parts are the main chassis pan, an entirely new front end, the rear motor pod and an upper chassis brace. The kit dramatically changes the way the original car works; the result is enhanced adjustability, increased chassis rigidity and all-new rear-suspension geometry. Let's jump right on in, feet first, and go through this conversion.

TELESIS UNDERWAY

The Telesis' main chassis is a graphite composite unit that has been fully routed to accept seven cells on the left of the chassis and three cells on the right. This is a sensible layout that allows the driver to set up the car with all six cells on the left, or to use a split saddle pack with three cells on each side of the chassis. I prefer the saddle-pack arrangement for racing on flat oval tracks and all six on one side for banked-oval tracks. The Telesis is already leaning (pun) toward my liking.



The front-end axle block was trimmed to remove unused material.

CHEETAH RACING TELESIS I



Scale1/10
Price\$224.54

DIMENSIONS:

Overall length14.5 inches
Width6 inches
Wheelbase10.5 inches
Front track7.25 inches
Rear track7.875 inches

WEIGHT:

Gross (with battery)43 ounces*

CHASSIS:

TypePan with upper brace
MaterialGraphite

DRIVE TRAIN:

TypePinion/spur
TransmissionDirect
DifferentialBall
Bearings/bushingsOnly if included
.....on original car

SUSPENSION:

Front:
TypeFloating kingpins

DampingCoil spring
Rear:

TypeSuspended pod
Damping.....Oil-filled, coil-over
shock with dampers
(from original kit)

WHEELS:

Front/rearNot included

TIRES:

Front/rearNot included

ELECTRICS:

Motor/battery/speed controllerNot
included

OPTIONS AS TESTED:

Precision Motorworks "Rage" stock motor; Reedy* Ultra 1400 batteries; Airtronics Caliber radio; Novak 410-HPC ESC and FM receiver; Futaba 9401 servo; TRC Pro-Cuts nylon one-piece black wheels and green foams; Protoform '93 Olds Cutlass body; custom paint by Bich'n Bodies.

HITS

- High-quality material
- Versatile chassis layout
- Very good handling

MISSSES

- Instructions lack details
- Kit could use some tuning hints

*Please note that the weight of the Telesis is dependent on the equipment and parts you use for the conversion. The use of the TRC tires and rims, large steering servo and other parts brought the weight up to 43 ounces. Lightweight rims and tires, such as those from Associated, and a lightweight mini-servo will drop an instant 1.5 ounces. With any care at all, the advertised weight of 40.5 ounces can easily be achieved.

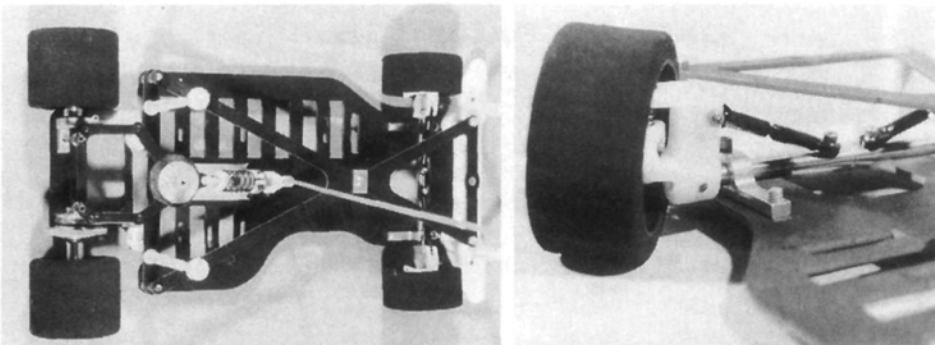
The instructions aren't as nice as the original Associated instructions. In fact, there aren't any photos—only a few illustrations—to assist in the assembly. Therefore, you should have some car-assembly experience if you want to get through the conversion quickly. Make sure that you pre-fit all of the pieces before final assembly.

To begin this conversion project, I took my ever-trusty RC10L SS down from the shelf

and set it next to the Telesis kit on my workbench.

TELESSEMBLY

To construct the Telesis, you'll need the following parts from the 10L SS: the motor-pod bulkheads, the entire axle with the diff, the shock, the shock/antenna mount, the ball joint for the shock, the ball pivots from the T-bar, the damper disks and the damper springs. The

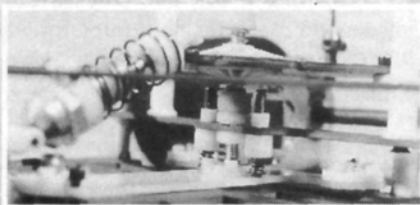


Left: the top view of the chassis shows the serious look of an oval vehicle. Note the choice of battery-mounting slots. Right: the Ultimate Front End mounted on the Telesis chassis plate. Note the camber-adjustment rod that's angled down from the kingpin carrier to almost the middle of the beam.

Telesis kit includes the upper and lower motor pod plates, a new T-bar, two ball pivots, a new threaded damper post, a new chassis cross-brace and all the necessary hardware.

You'll assemble the front end first (see sidebar). The rear end is assembled in the same manner as the original 10L rear pod, with the exception of the ball pivots, the damping post and the T-bar. The first thing you'll notice is that the rear end looks narrow. This is only a figment of the imagination. The rear end is the same width as the 10L SS, but the pod makes it look narrow.

PRO FLEX REAR SUSPENSION



The Cheetah Pro Flex rear end and the RC10L SS have different suspensions. The RC10L SS uses a T-bar for side-to-side and front-to-rear suspension movement. A friction-damper plate with two disks provides damping, with the assistance of an oil-filled, coil-over shock. On the Pro Flex rear end, the front-to-rear

motion is provided by twin tempered-aluminum ball pivots. By using the ball pivots, the stress against the T-bar is decreased, and this forces the coil-over shock to do the work. Overall front-to-back movement is greatly enhanced, and you no longer have to worry about excess stress on the T-bar.

The side-to-side movement of the Pro Flex rear end is still provided by the T-bar, and damping is provided by the same type of friction disk used on the original car. One improvement is the Pro Flex's threaded damper post. It allows a range of movement that's more accurate than the normal setscrew/wheel-collar adjustment found on the stock car.

The second thing you'll notice is that the rear end is really loose and floppy before you attach the shock. This is good, because this is what makes the shock do all the work for you.

The last thing you'll notice is that this rear-end kit has two spring-a-ma-bob things at the rear of the T-bar. These springs assist the T-bar in roll resistance during a turn, much as a sway bar does. The springs used here are the same as those used in the front suspension. You can change the side-to-side damping by changing the springs.

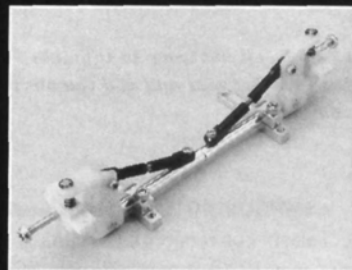
BRACE YOURSELF

The rear chassis brace is different from the original RC10L SS brace in that it supports the anti-roll springs and supports the main chassis brace—a pair of V-shaped graphite pieces that join at their points to form an "X." The brace makes the chassis very rigid. Its only drawback is that you can't use a low-profile body, e.g., a GTP or a Can-Am type, with it. Of course, we're using a NASCAR-type body anyway, so who cares?

From here, add the front bumper from the original car, the wheels, the bearings and all

CHEETAH'S ULTIMATE FRONT END

This single-beam front end may look like other single-beam axles, but that's where the similarities end. The Ultimate Front End has large, extraordinarily strong kingpin carriers that allow camber adjustment. At the top of the kingpin carrier is



an adjustable turnbuckle that is attached to the main beam. Each side is adjustable for camber, and the 4-40 rod is heavy enough to prevent flexing in the linkage. If you rotate the mounting blocks 180 degrees (cinch the screws toward the rear of the car), the wheelbase will be shortened by $\frac{3}{8}$ inch. The front-wheel suspension is basically the same as that of the original car.

The front end is split in the center, and this allows individual caster adjustment. As you know, the tires of almost any oval race car wear unevenly. Independent camber and caster adjustments allow not only maximum traction, but also more even tire wear. To prevent the two sides of the beam from rotating accidentally, the axle mounts are cinched down separately with a large 6-32 hex screw. All the front-end hardware is made of high-quality, tempered aircraft-grade material.

the radio gear. This completes the Cheetah Telesis conversion.

UP AND RUNNING

For radio gear, I used an Airtronics* CS-3P Caliber radio, a Novak* 410-HPc speed controller, a Novak FM receiver and a Futaba* 9401 servo. I also used a Precision Motor Works* "Rage" Series stock motor.

I chose TRC* Pro-Cuts mounted foam tires. The black TRC rims look great on the car.

(Continued on page 60)



SCHUMACHER

by FRANK MASI

Cougar Works

FOLLOWING THE overwhelming success of its C.A.T. (Competition All Terrain) 4WD car, Schumacher—a British-based manufacturer of high-performance R/C cars—decided that it was time to enter the 2WD off-road market.

Schumacher's* new 2WD Top Cat—the first 2WD car to employ a belt-drive transmission—met with mixed reactions. Though the car performed well, many critics felt that it had been somewhat over designed; it was too complex for most builders. What's more, the Top Cat's unique, "laid-down" front-shock design was inadequate for the large jumps on American off-road tracks.

Still determined to stake a claim in the 2WD racing scene, Schumacher redesigned the Top Cat, replacing the inboard front shocks with a more conventional upright set, and adding a hinged front bulkhead that allowed adjustment of the car's rake angle. The new Cougar emerged as a serious contender for the 2WD crown.

Never content to rest on its laurels, Schumacher has since updated the Cougar to the Cougar 2. The Cougar 2 has new shocks, and new, more rigid suspension arms molded of Schumacher's P.E.P. (Performance Engineered Polymer).



Cougar?

The newest version of the Cougar 2 is the Works Racing Spec model. It has all the new goodies that the Schumacher team drivers use; it's the latest and the greatest Cougar!

TRANSMISSION CHANGES

What's new about this car? The biggest change is that the belt-drive transmission's side plates were redesigned so that the diff could be moved toward the rear of the car. With this setup, the drive shafts are arranged in a straight line. Why do this? Apparently, the old Cougar 2's tranny layout, which angled the driveshafts rearward, tended to cause the car's front end to lift during acceleration, and this diminished on-power steering.

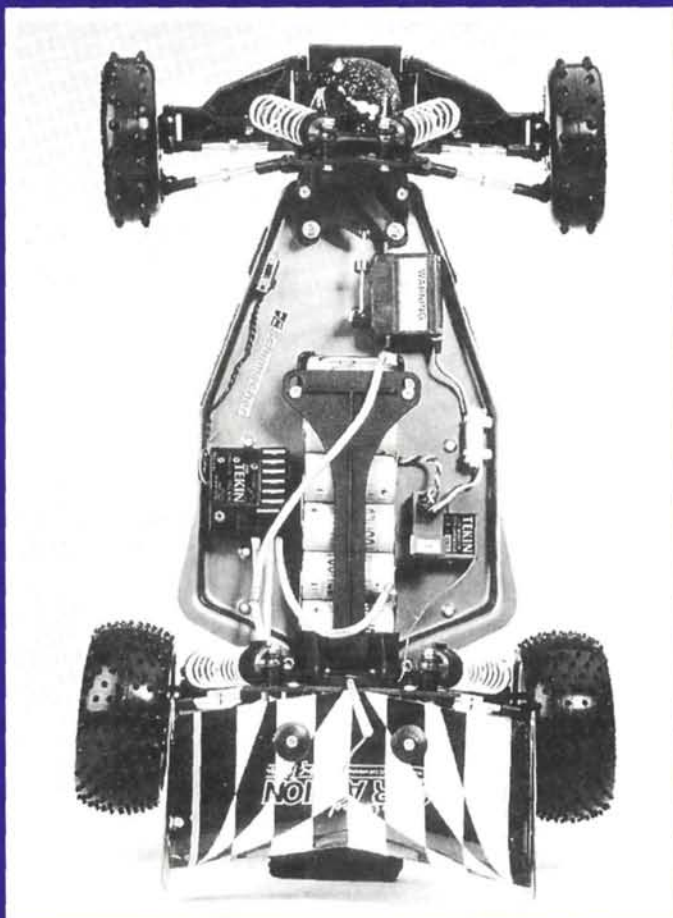
The beautiful, purple-anodized aluminum chassis is new from front to rear. In addition, the rear-arm mounting holes now allow for more anti-squat than before.

The Team Spec model has Schumacher's Pro-Diff, which has three ball bearings for super-smooth action. Separate drive washers fit into slipless alloy washer carriers that pivot freely on the ball bearings. Twelve tungsten-carbide diff balls, which come packaged in their own grease, are pressed into the main pulley. The thrust bearing consists of a molded ball race and washers that have their own built-in ball races.

The main drive pulley snaps into side fences that keep the belt from wandering, so the entire diff mechanism is protected from dirt and debris.

TRACTION ACTION

Speaking of the slipper clutch, Schumacher's is one of the best. The hard-anodized pressure plates reduce wear and provide consistent action. The PTFE (polytetrafluoroethylene, but there won't be a test later, so don't worry about it) slipper washer is sandwiched between the pressure plates, and it's durable enough to survive hours

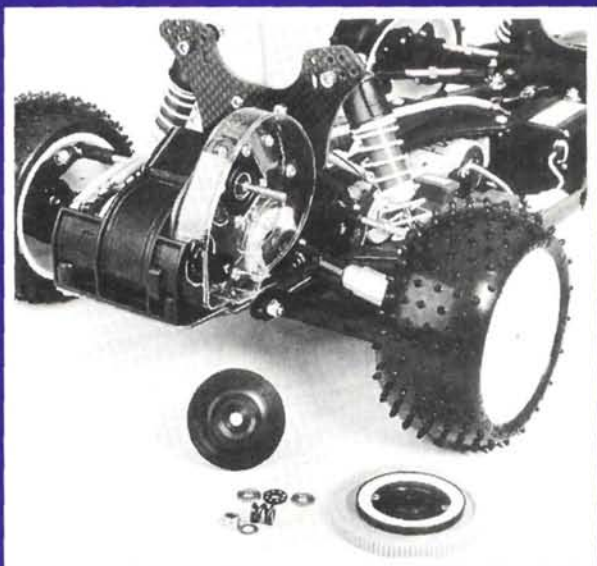


Though its general layout is somewhat conventional, don't be fooled: the Cougar Works has many new features, e.g., a belt-drive tranny and an adjustable-rake front-suspension mount. A new molded battery brace holds the pack in place.

of operation. Because the kit's 48-pitch, 95-tooth spur gear is bolted to the outer-slipper thrust plate, you don't have to disassemble the slipper to change the spur. (This would be a major hassle, because you'd have to reset the slipper.)

If you're in a crunch for a replacement spur gear, I've found that the ones that fit the Traxxas* TRX-1 can be bolted to the Cougar's slipper without modification.

I added Schumacher's optional alloy slider shafts to my Cougar. The slider halves are fitted with roller bearings, so their action is silky-smooth. Because the drive shafts are smoother, the car's rear suspension can move more freely. On very bumpy tracks, the car handles better and is more stable.



Schumacher's friction-type slipper clutch is standard on the Cougar Works. You can change the spur gear without disassembling the slipper unit, so settings can be preserved.

SCHUMACHER'S



You're at the track, and you're looking for that extra edge—that little advantage you'll need to beat the competition. Those two-hole pistons in your shocks aren't quite cutting the

VARI-SHOCKS

mustard. You check and then re-check your toolbox; you forgot to bring other pistons, and now you're in trouble! If you had Schumacher's Vari-shocks, you'd be able to alter piston valving *without* changing pistons.

With Schumacher's Vari-shocks, you simply fill them with the lightest oil you think you'll need for the track on which you'll be running—usually 10W. The two-piece pistons fit together to allow one, two, three, or four holes for heavy to light damping.

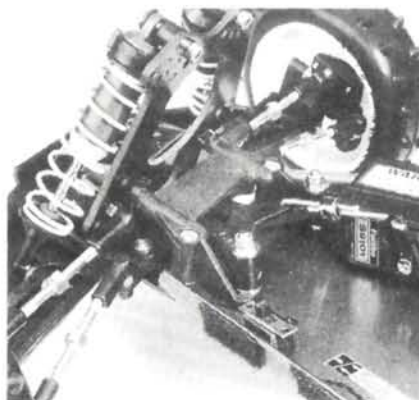
If your car's damping seems a little light, just rotate the top piece of the piston to cover up one hole and make the damping heavier. If it's too heavy, rotate the piece to uncover one hole. Though the ability to alter the shock piston's valving is something that only the most experienced racers will appreciate, being able to do so without actually changing the pistons is a neat trick—and a timesaver.



SLINKING SUSPENSION

The PEP suspension pieces used on the standard Cougar 2' are also used up front on the Works Racing Spec's new chassis. The arms are extra-long and very rigid, and they're fitted to Schumacher's variable-rake front bulkhead. You can set rake angle at 20, 25, or 30 degrees by inserting or removing spacers between the bulkhead brace and the front shock tower. Altering rake will change how the car handles bumps and how it corners.

In the rear, new Works arms, which are longer than those on the



To alter rake angle, put spacers between the front suspension brace and the shock tower. Removing the spacers yields a more extreme rake angle, while adding spacers gives less rake. For more precise cornering, I used Schumacher's ball-raced steering-arm kit.

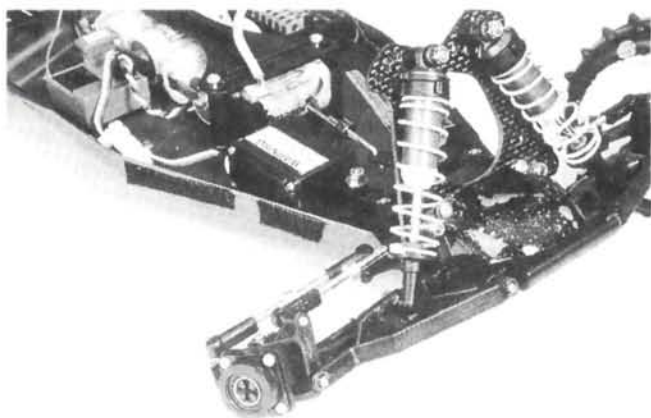
regular Cougar, are attached with small molded blocks. You can adjust rear anti-squat and rear toe-in by inserting or removing spacers between the blocks and the chassis.

BUMP-SOAKERS

Two pairs of Schumacher's hard-anodized Vari-shocks—medium-length for the front and long for the rear—are fitted to the rigid, carbon-fiber shock towers.

An assortment of color-coded springs—four pair for the front and four pair for the rear—are included in the kit, and this makes track-tuning much easier. The springs are rated by length and rate.

I set my Cougar's shocks the following way: 20W Associated* silicone shock oil in all four shocks; two holes open in the front pistons and three holes open in the rear. I used the softest springs, (the yellow M2s) up front, and the softest rears (the white L1.5s).

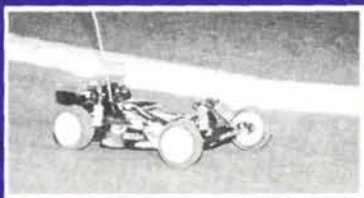


The Cougar Works' front arms are made of Schumacher's PEP material, so they're extremely rigid. The Cougar's front wheel bearings are in the steering hubs rather than in the wheels.

ON-TRACK TESTS

I took the Cougar 2 Works to the large indoor track at Queens Off-Roaders in Long Island City, NY, and I entered it in the Stock Class. (I drove my other car—a Losi Pro-SE—in Modified.)

The track was so hard-packed that I fit the Cougar's Aerodisc 2.2-inch wheels with Yokomo* foam tires (TF20s up front and TR20s in the back). I set the ride height so that the drive shafts were slightly below level in the rear and the front arms were just below level (so that when viewed from the side, the chassis was level). Using the





New, longer Works rear-suspension arms are molded of Schumacher's PEP material. For more stable handling on very rough tracks, I added Schumacher's optional alloy roller shafts. The shaft halves are bearing-supported, so they operate with very little friction.

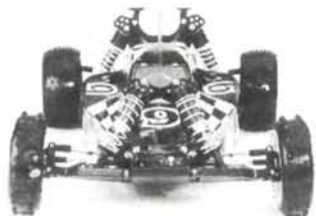
I installed the fronts in the middle hole on the arm and in the middle inside hole in the new tower. The rear shocks were fitted in the outside hole in the arms and in the lower inside hole in the tower. (Bear in mind that I used these settings for my track, which has a lot of bite, so they may not work for your track.)

SCHUMACHER SETUP

I used my Airtronics* Caliber transmitter to control the new kitty-on-the-block. On board, a Tekin* TFM mini-receiver picked up the signals. I connected a Futaba* S9301 servo to Schumacher's optional slop-free, ball-bearing-supported steering bellcranks.

A 6-cell pack of Trinity's* Pushed Panasonic P-170s is held down with a molded T-plate that keeps the pack from coming apart during harsh shocks. Battery power flows to the Trinity Championship Edition 13-turn modified motor through a Tekin 411G ESC.

The Cougar comes with Aerodisc 2.2-inch



SCHUMACHER COUGAR 2 WORKS RACING SPEC

Scale 1/10
Price \$299.95

DIMENSIONS:

Overall length 14.9 inches
Width 9.75 inches
Wheelbase 10.44 inches
Front track 8.5 inches
Rear track 8.25 inches

WEIGHT:

Gross (with battery) 3 pounds,
4.44 ounces

CHASSIS:

Type Stamped tub
Material Anodized aluminum alloy

DRIVE TRAIN:

Type Belt-drive (2.43:1 ratio)
Primary Pinion/spur
Differential(s) Ball
Bearings/bushings .. Sealed ball bearings

SUSPENSION:

Front/rear: Type Independent A-arm
Damping Oil-filled shocks
with variable pistons

WHEELS:

Front: Type One-piece
molded Aerodisc
Dimensions (DxW) 2.2x1 inches
Rear: Type One-piece
molded Aerodisc
Dimensions (DxW) 2.2x1.375 inches

TIRES:

Front 2x20 two-row studded
(blue compound)
Rear 12x20 mini-spike
(blue compound)

ELECTRICS:

Motor, battery, speed controller
Not included

OPTIONS AS TESTED:

Airtronics 3P transmitter; Tekin T-FM mini-receiver (75MHz); Futaba S9301 servo; Tekin 411G ESC; 6-cell pack of Trinity Pushed Panasonic P-170s; Trinity Championship Edition 13-turn modified motor; Schumacher Alloy Roller drive-shafts (U817); Schumacher ball-raced steering lever set (U820).

HITS

• Improved drive train and suspension geometry make for world-class performance right out of the box • Absolutely the smoothest ball diff on the market • Meets ROAR minimum-weight requirements (52 ounces) without modification or after-market parts • Purple-anodized chassis is perfect for impressing your racing friends

MISSES

• Instructions, though improved, still need more clarification, especially if the car will be built by beginners • May be too sophisticated (e.g., Vari-shocks and the multitude of camber-rod mounting holes) for novices. Should perhaps have a more in-depth tuning section in the instructions.



T I N G

kit's turnbuckle linkage, I set the rear end with about 1 degree of negative camber, and the front end with 1 degree of negative camber and 2 degrees of toe-in.

In the pits, other racers gave the new Cougar the once-over. Everyone really dug the purple chassis. Comments ranged from "How much is it?" to "Wanna sell it?," and the car hadn't even hit the track yet!

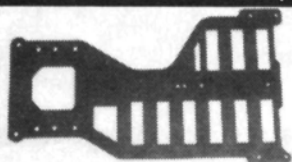
On the track, the Cougar Works performed like a world-class racer. I didn't have the time to dial-in the car completely, but I found it very easy to drive. Jumping was very consistent, and the new drive-train

layout worked well; on-power steering was plentiful! The slipper did its job admirably, and wheel spin was kept to a minimum. The car tended to oversteer when it entered turns, and it was sometimes "twitchy" on the straights. Some of this can be attributed to my setup, but I think it could also be the belt-drive tranny (the belt may have been set too tightly), which, by the way, produced rocket-like acceleration.

When the dust had settled, I had qualified 9th in the A-Main and finished in 6th—not bad for a car I'd never driven before. What's more, my lap times in Stock with the Cougar were only a few tenths of a second slower than my modified times!

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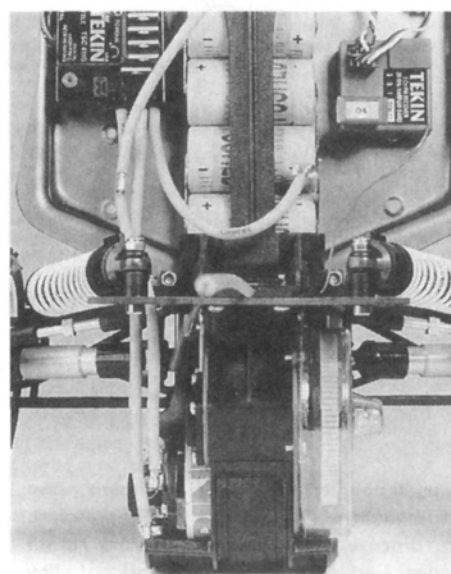
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COUGAR 2 WORKS



As you can see in this photo, the drive shafts of the new Cougar are in line with each other. This gives the car more on-power steering, so it can exit turns quickly.

wheels that are designed to prevent dirt from building up. Schumacher's excellent two-row front tires and medium-spiked rear tires also come in the kit.

Rich Muise of Motion Graphics* once again came through with flying colors (sorry) by covering the low, sleek Cougar 2 body with the hot-looking "checkered flag" motif that you see in the photos.

KITTY CONCLUSION

Schumacher has come up with a sure-fire winner with the Cougar 2 Works. On the track, it handles well enough to be included in any A-Main. On the workbench, it's the easiest to build of any Schumacher car I've assembled.

For those who want to be competitive, but don't want to drive the same car as everyone else, the Cougar 2 Works is worth serious consideration.

*Here are the addresses of the companies mentioned in this article:

Schumacher Inc., 6302 Benjamin Rd., Ste. 404, Tampa, FL 33634.

Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Tekin Electronics, 940 Calle Negocio #140, San Clemente, CA 92673.

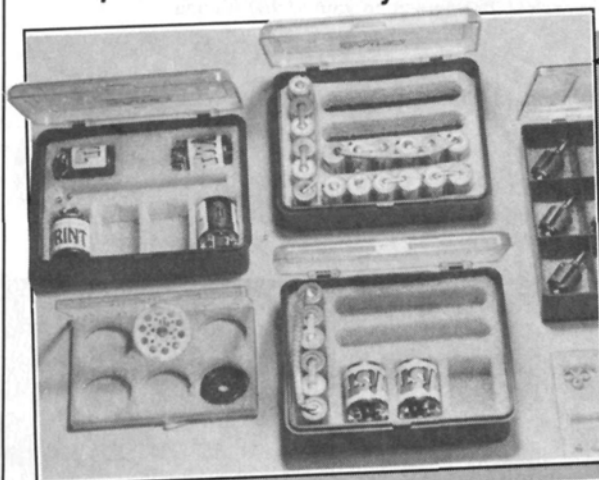
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.

Motion Graphics, 2645 Robert Arthur Rd., Westminster, MD 21157.

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Stay On
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and Off
Your Lid

Race Truck Suspension Tuning

by JOHN HURTZ

ARE YOU RACING your truck without experimenting with its set-up? If you are, you're missing a great opportunity.

All racing trucks allow you to make adjustments to improve handling and performance. But if these adjustments seem confusing to you, you might feel reluctant to change *anything*. That's why I'm here to give you a basic idea of how most of the adjustments you can make will affect your truck.

TAKE NOTE

- **Don't copy someone else's setup.** Try making changes yourself, and try to understand why they work. It's very hard to remember everything you try and what its effects are, so make a note of everything you do to improve your truck's performance. By doing so, when you're at a race and practice time is at a minimum, you'll be able to consult your notes and find out what adjustment should work to solve a problem that's holding you back. Some adjustments *don't* pay dividends, so avoid making "blind" changes when you're under pressure. Many adjustments that don't work well alone will,

however, help to improve your truck's handling when made with other changes.

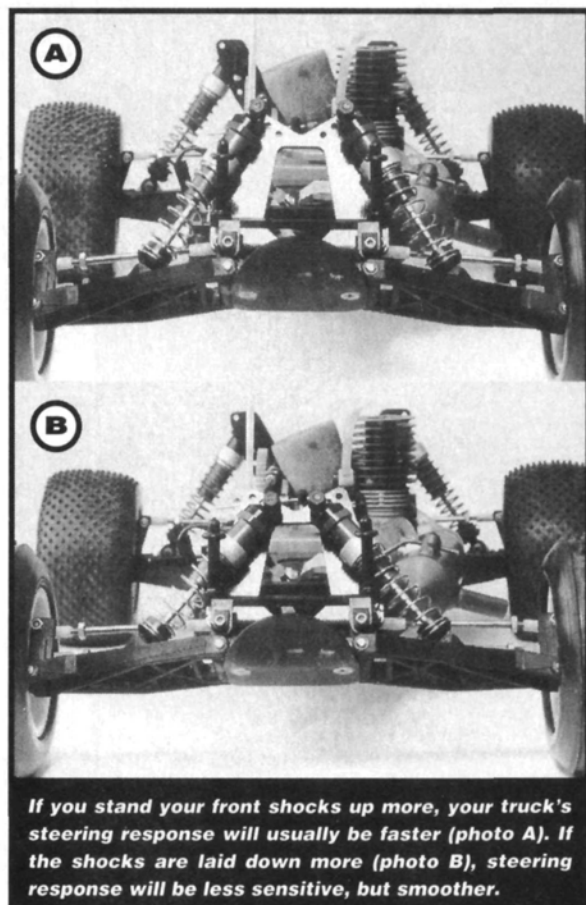
- **Follow manufacturers' suggestions.** Before most truck kits are sold, they've been extensively tested by a team that has come up with good basic setups. Front- and rear-end adjustments are most frequently made to:

- shocks (springs, oil and pistons)
- camber
- toe-in
- shock angle
- anti-squat

FRONT-END ADJUSTMENTS

- **Shocks.** Here, you'll probably alter damping most often, and you'll do this by trying oils of various viscosities and pistons with different valving.

Light damping allows the front suspension to operate more easily and to lessen the shock of small bumps more efficiently than heavier damping. It also allows weight to be transferred more easily. For example, on a high-bite track, light front-end damping will make the front "dive" harder (more weight will be transferred to the front). This will allow the truck to enter a cor-



If you stand your front shocks up more, your truck's steering response will usually be faster (photo A). If the shocks are laid down more (photo B), steering response will be less sensitive, but smoother.

ner faster, but its steering won't be as responsive in the middle of the corner or when it's leaving it as it would with a heavier damping.

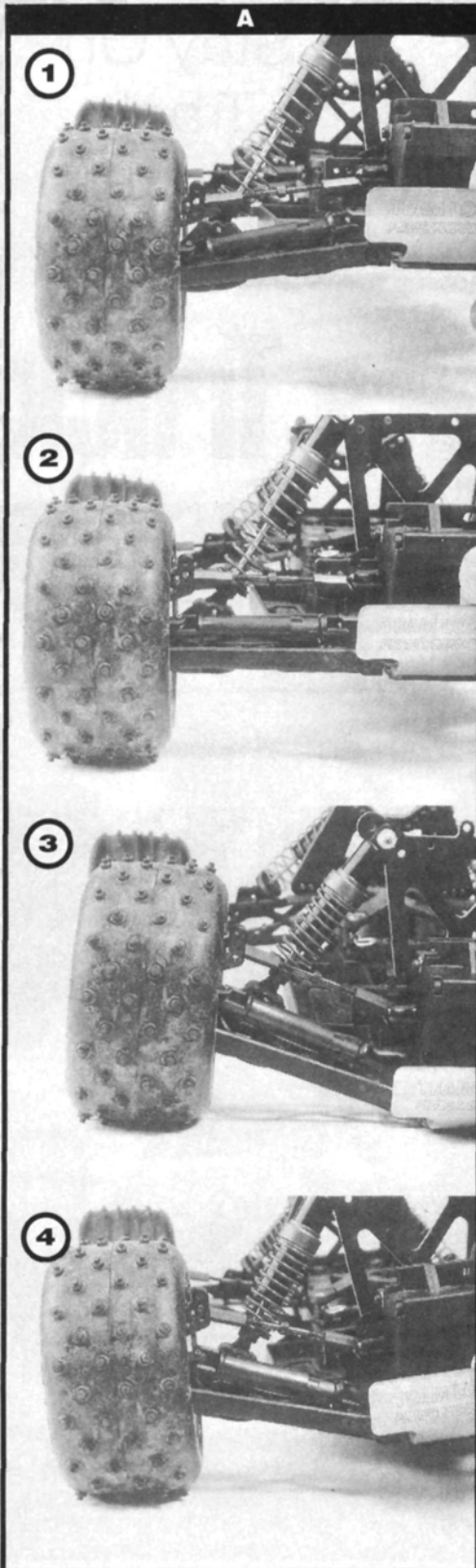
If front damping is too heavy, the truck will be "twitchy"—over-sensitive to steering commands—and the front end will bounce more, even on minor bumps.

For jumps, a lighter front damping is better. It allows the front suspension to compress, and this keeps the front end on the track. A heavier front damping means less suspension compression, and this will make the truck's nose jump higher.

• **Springs.** Lighter springs generally increase

low-speed steering and reduce high-speed steering. Stiffer springs do the opposite. Spring preload, i.e., the amount a spring is compressed when the shock is fully extended, also affects a truck's handling. Spring preload also determines a truck's ride height, and ride height affects handling. Generally, the higher

Camber-Rod Positioning



If the upper camber rod is nearly as long as the lower A-arm and is mounted almost parallel to it, camber will change very little during suspension travel.

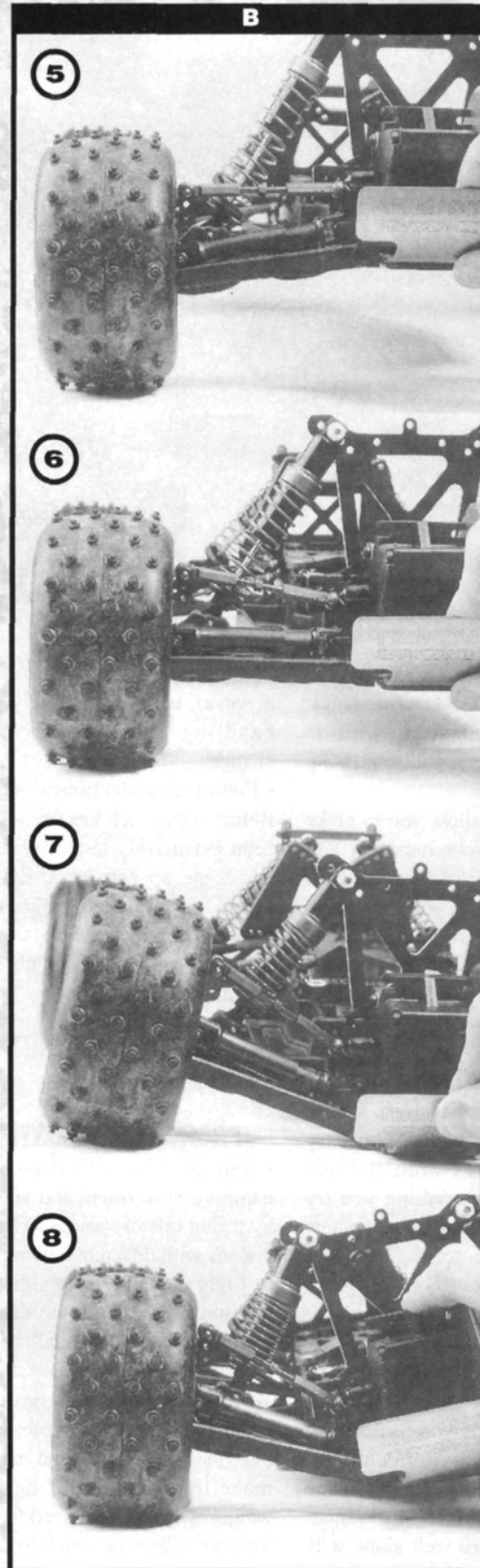
Check out photo sequence "A."

1. At full suspension height, the tire has about 1 degree of *positive* camber.

2. At normal ride height, it has about zero degrees.

3. At full compression, the tire has about 2 degrees of *negative* camber.

4. This setup causes the tire to lean in the direction of chassis roll. On very high-bite tracks, this setup may be most desirable.



A camber rod that's much shorter than the lower suspension arm will cause camber to change more drastically as the suspension is compressed. Mounting the rod at a different angle from that of the arm will also cause camber to change more.

In photo sequence "B," you'll see that:

5. The tire has about 2 degrees of *positive* camber when the suspension is at its full height.

6. As the suspension is compressed to normal ride height, the tire has about 1 degree of *negative* camber.

7. Camber changes drastically when the suspension is fully compressed. At this position, the tire has nearly 5 degrees of *negative* camber.

8. This setup works well for low-bite tracks because the tire stays nearly vertical, despite chassis roll, so when the vehicle corners, its contact area is larger.

a truck rides, the better its high-speed steering will be; and the lower its ride height the better its low-speed steering. Avoid having your truck ride too low, or it will "wander" at high speeds, especially on the straights. Don't let your truck ride too high, either; if it does, its steering will be very sensitive at high speeds, and it will have very little steering at low speeds.

• **Shock-mounting position.** The angle at which the front shocks are mounted more or less determines a truck's steering sensitivity. If the shocks are stood up more, steering response will be faster, but not quite as smooth. If the shocks are laid down more, steering response will be slightly slower, but also smoother. Laying the front shocks down too far can result in an overall loss of steering balance.

• **Camber-rod position** is difficult to explain. The position of the camber rods affects the truck's roll center. For the purpose of this article, we'll say that roll center determines the type of camber change that occurs during suspension movement. On most trucks, the camber link can be mounted in any one of several positions, and it's almost impossible to say what each will do. Try them for yourself. Some positions provide extreme camber changes, while others provide almost none. Experiment and see which works for you.

REAR-END ADJUSTMENTS

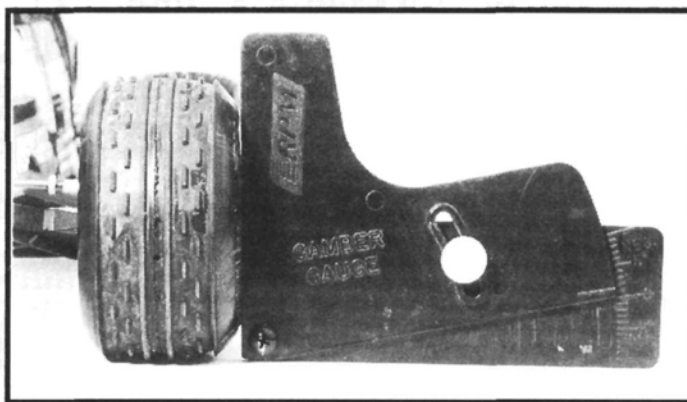
• **Shocks.** Use rear shock damping to help "dial-in" your truck. Lighter rear damping will act in much the same way as lighter front damping: it will more effectively absorb the shock of small bumps than heavier damping would. But if it's too light, two things may happen. First, the truck will bottom-out very easily on large jumps. Second, the truck will tend to roll too much. This will make the truck "hook" (spin out) when exiting corners, and it might make it "wander" in the straights. If your rear damping is too light, your truck will feel "loose" as it enters a high-speed corner.

If, on the other hand, your rear damping is too heavy, your truck will bounce badly on rough parts of the track and have less rear traction at low to medium speeds.

Front and rear damping always involves a compromise between being too light and too heavy. Try oils of several weights to find which is best for your truck.

On the bumpy parts of the track, the rear springs act much like the rear damp-

(Continued on page 60)



Setting your camber correctly is vital to your truck's performance. By using a gauge, such as the one offered by RPM*, you can set each wheel's camber perfectly.

Adjusting Camber and Toe-in

You can alter front toe-in to adjust your truck's steering sensitivity. But first, you should measure it, and it's easy to do this. Using a small tape measure, measure the distance between the *backs* of the two front tires, then measure the distance between the *fronts* of the two front tires. If the second measurement is smaller, your truck has toe-in; if it's greater, the truck has toe-out. Slight toe-in is probably best. Toe-out can make a truck "twitchy" and can make it wander on the straightaways. Too much toe-in can make a truck push and lose steering.

On most trucks, you can adjust front and rear camber by shortening or lengthening the camber link.

• **Positive camber.** The tops of the wheels are angled outward.

• **Negative camber.** The tops of the wheels are angled inward. You can check camber with a small drawing triangle. Put the truck on a table, and put one edge of the triangle against the table and one edge against a tire. Always check camber with the car sitting at ride height (don't push down on it in any way).

That way, any adjustments you make will be consistent.

For the most part, you need 1 or 2 degrees of negative camber on the front and rear tires. Having more negative camber in the front will usually make steering seem smoother, but it can also cause a loss of steering. Positive front camber will initially make the steering more sensitive, but it may cause a loss of steering at high speeds.

Be careful when you adjust front camber, because when you alter it, you'll change front toe-in slightly, too. Be sure to check front toe-in after making camber changes.

Rear camber can affect rear traction. Ideally, you want to have as much of the tires' surfaces on the ground as possible. If your truck feels as if it's losing traction in the middle of corners, try increasing negative camber slightly. The loss of traction could be the result of the rear tires losing surface contact.

On high-traction tracks, increasing front or rear negative camber can help to prevent your truck from traction-rolling in corners.

Shock Oil and Springs

The most common adjustments we make are to the shock oil, the pistons and the springs. Take an assortment of oils and springs to the track.

Don't mix oils of different brands, because companies use different *types* of oil, and they grade them differently. The silicone-based shock oils offered by Associated, Trinity and Team Losi are the most resistant to temperature changes, so you don't have to change them as frequently as you change others. Some oils, such as Team Losi's, are color-coded, so if you forget which oil you put in a particular shock, you'll be able to identify it.

Most springs can be used on any of the available shocks, but you should check their diameter to ensure that you can use them with your shock collars. Certain springs, e.g., those offered by Associated and Team Losi, are marked with a "spring rate." They're easier to work with than springs rated "soft," "medium," etc., because you can assess more accurately just how much softer or stiffer one spring is than another.

To dial your car in at the track, you must have a good selection of springs and shock oil.

Silicone oil isn't affected by temperature, so make sure you have some if you race in particularly hot or cold conditions.



RACE TRUCK TIRE SELECTION

by WILL ROBINSON



*Traction
for the
taking!*

IF YOU PLAN to race at a certain track, it's a good idea to call the shop that's affiliated with that track to find out which tires work best on its course. You can save yourself from taking many different tires and also save time testing tires at the track. If you can't find out ahead of time, you may need to test several sets of tires when you arrive at the track. I can help you decide which to try.

WHERE TO START

When you arrive at the track, take a look at the trucks that are running. Find one that looks like it's getting around the track well, look at its tires, and start with a set that's as close to them as possible. This will usually get you in the ballpark. From this point, you can experiment with subtle variants of these tires; you might find some that work even better!

Generally, for tracks with loose or fluffy dirt, use rear tires that have bigger, longer spikes. There are several tires that fit this bill: Team Losi® Offset Six Row or X-Pattern tires, Trinity® Baja standard spiked tires and Pro-Line® Gladiator tires. Large spikes work better in loose dirt because they don't "load up" with dirt. When tires fill with dirt between the spikes, the result is usually a drastic loss of traction.

Use tires with medium or short spikes, or step-pins if the track is mostly packed down and has a small amount of loose dirt. On surfaces of this type, longer spikes aren't as good because they flex to the side and cause the tires to "squirm" and lose traction. You can "nip" longer spikes to make them shorter and increase traction on a slick track. (See sidebar on tire nipping.)

RACE TRUCK TIRE SELECTION

Mini-pin tires are popular for hard-packed, dry, slippery tracks. Mini-pin tires have many short, tiny spikes that provide more contact with the track and don't flex a lot, so traction is increased.

COMPOUNDING THE PROBLEM

I'm sure you're aware that there are also several different tire compounds available. When you select a compound, remember that soft tires usually work best on slippery tracks, and stiff tires usually work best on loose tracks that have high bite. If you use very soft tires, you may want to use foam tire inserts to help stiffen them. (See sidebar on tire foam.)

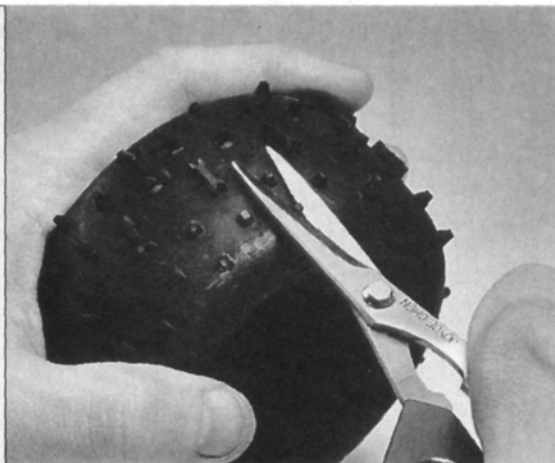
TRY AS MANY AS YOU CAN

Now that you have a general idea of the type of tire to use, it's time to narrow your selec-

TIRE NIPPING

The performance of most tires on medium to low-bite surfaces can be enhanced by nipping the spikes on the tires. In addition to making the spikes shorter and stiffer, it gives them sharper edges. Tire nipping also increases the life expectancy of your tires.

The best way to cut the spikes is with a pair of good wire cutters or a pair of tire-nipping scissors. If the edges of the spikes become worn, nip them slightly shorter. This will make the spike square again and give the tires better traction.



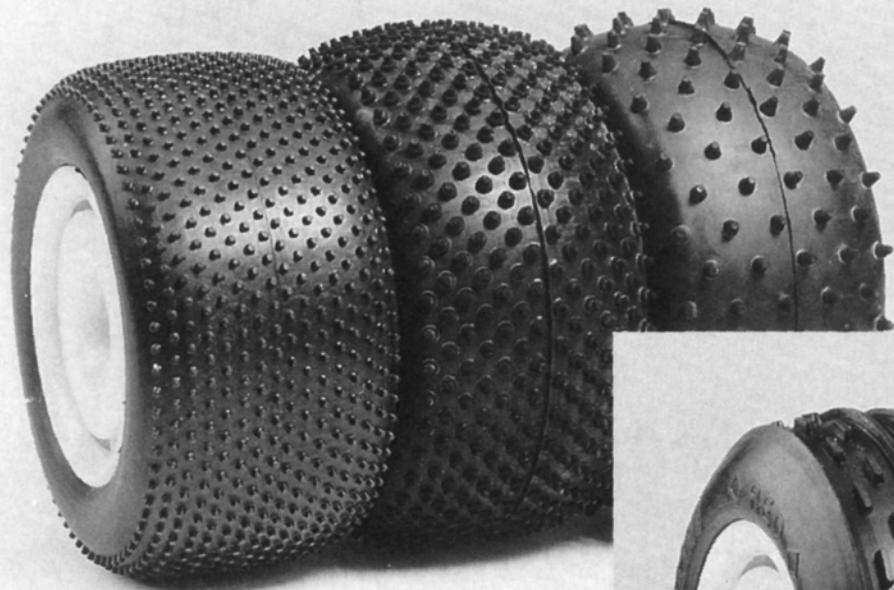
to back, you'll know that the track conditions are the same for both sets of tires.

Try different tires for different track conditions. This can be useful if the track is dry, or if it's watered heavily just before your

heat. Some tracks change drastically after they've been watered. Knowing which tire to use for every track condition can be a plus. It may even make the difference between first qualifier and 11th qualifier.

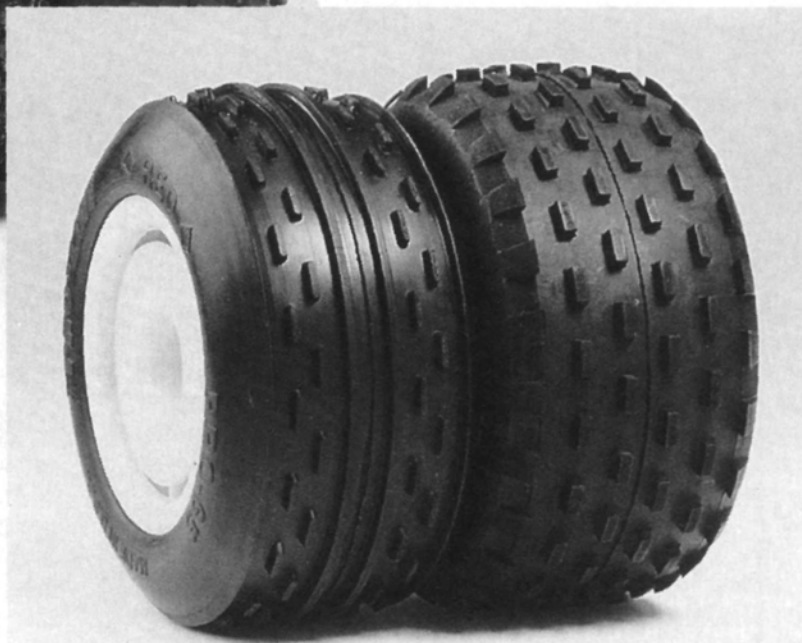
STEERING YOU RIGHT

Front-tire selection is equally important. You can have all the traction in the world, but your truck still has to turn. If you look around the track, you'll probably find that almost everyone uses similar front tires. The most common ones are Pro-Line fronts and Team Losi ribbed. Ribbed front tires are more consistent and much smoother than spiked front tires. If the track has mostly loose, loamy dirt on it, staggered-rib front



The type of dirt you race on will determine which tire to use. Mini-pin tires (left) work best on very hard-packed surfaces, while step-pin tires (middle) can be used on tracks that have medium-packed dirt. Tires with large spikes (right) usually work well on very loose, fluffy surfaces, because their spikes don't clog.

tion down to the best choice. The most effective way to test tires is to try them back to back. Run one type for a few laps to get a feel for them. Then, during the same battery charge, try another type. If a friend can change tires for you, that's even better. The reason you should test tires in this manner is to be sure that one type doesn't feel better because the track changed a little. If you try the tires back



Staggered-rib front tires work well on loose dirt because their treads have more edges to penetrate the deeper dirt.

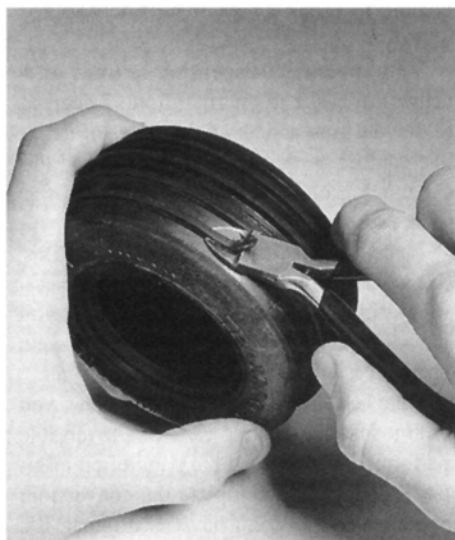
PHOTOS BY WALTER SIDAS

tires might be a better choice. Staggered ribs have more edges to penetrate the track's surface, and this will give your truck a little more steering. These tires usually provide adequate traction, so there's very little need for spiked tires on the front of a truck.

It's possible to get more steering from ribbed front tires. If you need a little more steering than the standard ribs give you, cut out a rib or two. Remove the outside rib first, and try the tires. You can get even more steering if you remove one of the inside ribs as well.

MAKE A NOTE OF IT

When you're happy with your combination of tires, make a note of the track conditions and the tires that you used. This will be handy the next time you go to a track with similar conditions. All you'll have to do is look up the conditions in your notes and start from there.

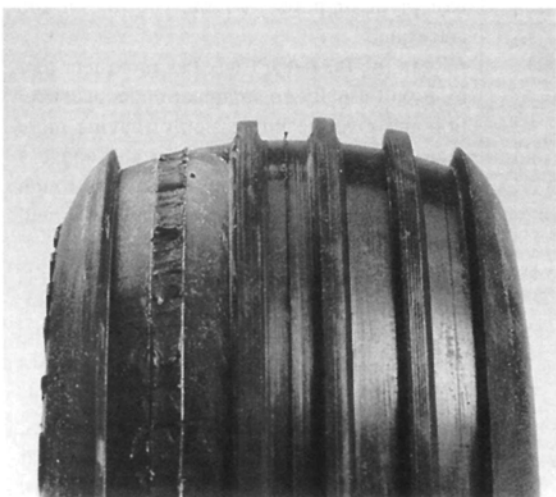
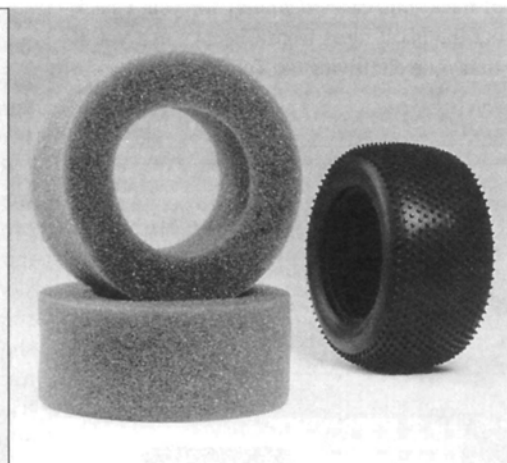


Trimming the rib from a front tire can give it more grip—and that means more steering for your truck! Use small scissors or side cutters to perform this task easily.

TIRE FOAM

Foam tire inserts can be useful tuning aids. Foam is especially good for soft-compound tires such as Pro-Line's XTR. The foam ring supports softer tires and helps them to hold their shape. Foam inserts are available from Associated, MIP and Parma.

Because the front tires are subject to much more side load than the rear tires during cornering, foam can be helpful in front tires as well. With foam inserts, front tires have a little more steering, especially



Steering can be gained by trimming the outermost rib from a front tire. If still more steering is needed, try trimming away the innermost rib as well.

In truck racing, choosing the correct tires is more than half the battle. With the information in this article, you should be able to dial-in your truck to nearly any type of track in no time at all.

Let your competition struggle on—and if they ask you why you're so fast, tell 'em you read *Car Action*!

**Here are the names of the companies that are mentioned in this article:*
Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (714) 465-9728.

Trinity Products Inc., 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 872-1605.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223; (714) 849-9781. ■

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CHEETAH TELESIS

(Continued from page 44)

BODY BEAUTIFUL

I used the latest body from the guys at Protoform*—the 1993 Olds Cutlass NASCAR. This narrow body has great scale looks and some very obvious aerodynamic lines that spell speed. It's a perfect fit for the Telesis. The body was custom painted by one of the best paint guys in the business—Scott Bich of Bich'n Bodies*.

The final weight of the car, ready to run, was a trim 43 ounces, including the stock RC10L SS hubs. It doesn't look like a lightweight, but it is. Let's put it to the test!

CUTTIN' SOME HOT LAPS

I tested the Telesis on the indoor oval at Hobby City Raceway in San Diego, CA. This short, challenging asphalt oval with banked turns demands a car that's well-tuned and able to turn quickly. It's a driver's track!

The first time on the track, the Telesis didn't turn well, but a change to .020-inch front-suspension springs solved this problem. The Telesis was smooth on the track, ironing out the three "bumps" on the main straight that other cars had trouble with. The rear end trails tightly behind the front end, as long as you don't dump everything you've got from

the throttle in the apex of the turn. The narrow rear end will hold on, but if given the chance to break away, it will do so very quickly.

With my static suspension settings of 4 degrees of caster to the right front, 2 degrees to the left front and about 3 degrees of negative camber on the right front tire, I had the car running on pace with the fastest of the stock cars.

Is the Telesis worth the conversion? This is a valid question when you consider the cost of putting it together with a car that you already bought. It certainly handles very well, and it's easier to adjust than the original car.

The Telesis conversion kit provides you with a smooth-handling car that's a versatile performer. You'll need the parts of an original RC10L SS to complete the conversion, and even if you don't have an original, it's worth purchasing the required parts separately to make the conversion. The chassis, with its unique cross brace, is stiff where it should be and provides excellent handling. If oval is your game, this car is a prime candidate. If you do a lot of oval racing on different types of track, this car is *definitely* for you. Check out the latest ideas from Cheetah, and you'll find yourself driving the Telesis.

*Here are the addresses of the companies mentioned in this article:

Cheetah Racing, 10823 Amestoy Ave., Granada Hills, CA 91344.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Precision Motor Works, 4950 Waring Rd., Ste. 12, San Diego, CA 92120.

TRC, 2211 Charter St., P.O. Box 1058, Albemarle, NC 28002.

Protoform, 1733 Maryland Ave., Unit 3, Niagara Falls, NY 14305.

Bich'n Bodies, 4903 Cloverfield Dr., Pearland, TX 77584.

Reedy; distributed by Associated Electrics

SUSPENSION TUNING

(Continued from page 53)

ing. Having stiffer springs has much the same effect as having heavier oils, and softer springs have an effect that's similar to using a lighter oil. When the truck corners, however, the opposite happens. For instance, if you try a lighter spring, the oil is then heavier (relative to the spring). This causes the truck's weight to be transferred more easily, but it won't return to center as easily because the lighter springs are less able to counter the "heavier" oil's resistance. Because of this, it's common practice to change oil when you change springs to maintain the balance between the two.

• **Rear-shock angle.** This also affects your truck's handling. A more vertical shock will probably increase traction when your truck moves from a stop. The downside is that its steering will be more sensitive, and it might seem loose in some corners. Mounting the shock at more of an angle can lead to a loss of traction from a stop, but may also make your truck feel smoother in corners. Like most adjustments, shock-mounting position is a compromise. By changing the rear hubs or the rear pivot supports, you can vary toe-in and anti-squat.

• **Rear toe-in.** If the truck has more rear toe-in, it will usually go straighter under acceleration and give the impression of having more rear traction. Increased toe-in can cause a truck to bounce slightly more on very rough parts of the track. Having too much toe-in will lead to a loss of top-end speed.

• **Anti-squat.** Looked at from the side, this is the angle at which the rear arm is mounted. It's called "anti-squat" because the more the front end of the mounting pin is angled upward, the more the rear suspension pushes up on the chassis under acceleration. Typically, more anti-squat also allows rear suspension to absorb bumps better when *not under acceleration*. When accelerating, however, it usually makes a truck bounce more.

(Continued on page 103)

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KYOSHO

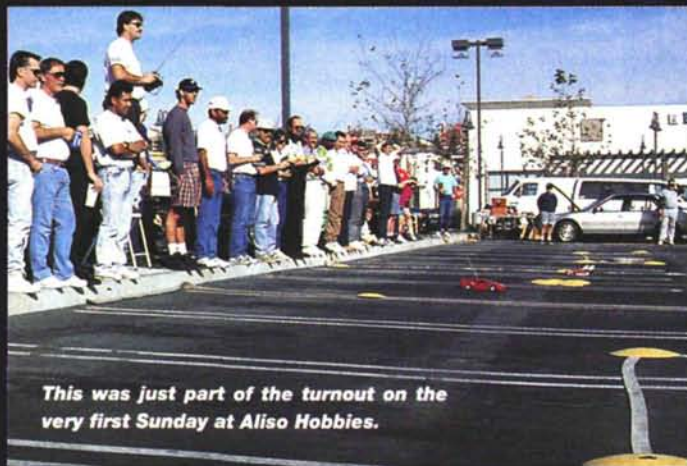
JORDA

Scale fun



The Jordan Yamaha F1 kit on the track. This one is M. Gugelmin's no. 33 version, and with the kit's decals, you can also replicate the no. 32 car of S. Modena.

PARKING LOT RACING—GETTING BACK TO GRASSROOTS



This was just part of the turnout on the very first Sunday at Aliso Hobbies.

This past January, something curious started to happen in Southern California. No, not rain, or earthquakes, but a seemingly spontaneous outbreak of R/C races in hobby-shop parking lots! What a concept!

Ron Williams and Tim Bump of Aliso Hobbies in Aliso Viejo, CA, got permission from a neighboring restaurant to use a section of its parking lot for Sunday-morning racing. Using easily removable sections of an old fire hose and yel-

IN YAMAHA F1

for low bucks

by MIKE OGLE

FORMULA 1 (F1) racing is truly an international motorsport. In Europe and Japan, F1 drivers are national heroes, held in the same high esteem as professional baseball or football players in the U.S. Their racing machines bear the names of some of the world's most renowned auto makers—Ferrari, Lotus, Honda, Maserati and the hybrid McLarens and Jordans.

While most of us can only fantasize about what it must be like to pilot such exotic machinery, pulling five lateral Gs while hurtling down the picturesque seaside streets of Monaco, we can all get in on a little piece of the excitement, thanks to Kyosho's* newest release—the beautiful, 1/10-scale F1 Jordan Yamaha.

Built on an injection-molded double-deck plastic chassis, the Jordan looks like a perfectly scale static model—it's that well-detailed. The Jordan's exotic curves and its distinctive "bent" front dihedral wing have been faithfully reproduced, as have the narrow front suspension struts and the triple-element rear wing. The kit includes a complete decal sheet that allows you to model either the no. 32 Jordan of S. Modena or the no. 33 car of M. Gugelmin. The Jordan is one of the most striking and oddly beautiful race cars ever built, and Kyosho has really captured its spirit in this kit.

(continued next page)



PHOTOS BY MIKE OGLE



Ed Frey of Tamiya America dropped by to show off two as-yet-unreleased cars—the Footwork F1 and Tamiya's new Nissan GTP car.

low plow disks (for corner dots), they laid out a small roadcourse that was perfect for the little F1 cars to navigate—with the emphasis on handling, not horsepower! By word-of-mouth alone, more than 50 racers turned out on the very first Sunday!

A few miles up the freeway, HobbyTown, in Irvine,

(continued next page)

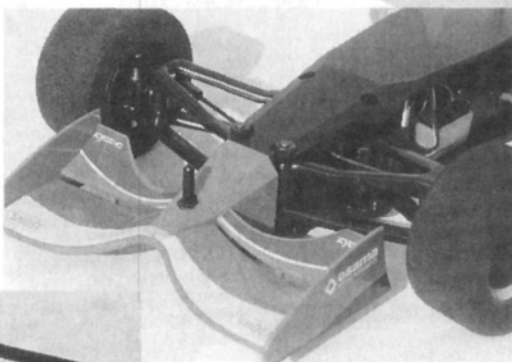
Kyosho and Tamiya F1 cars made up the majority of entries. Aren't they refreshingly scale-looking?



Don't think that it's all show, however! If you take a look under that gorgeous body, you'll see that a lot of thought was put into the Jordan's design with racing in mind. The double-deck chassis is made of a molded-plastic lower plate that holds the steering servo, the radio gear and the speed controller, and an upper "stiffener" that extends from the front suspension arms to the battery-mounting tray. At first, I thought that the upper chassis was just cosmetic, because it simulates the carbon-fiber mono-coque structure found in the full-size F1 cars. But don't even think about running the car without it! It doesn't weigh much, and the lower chassis is much too flexible to run without it. Kyosho offers a graphite lower-chassis plate



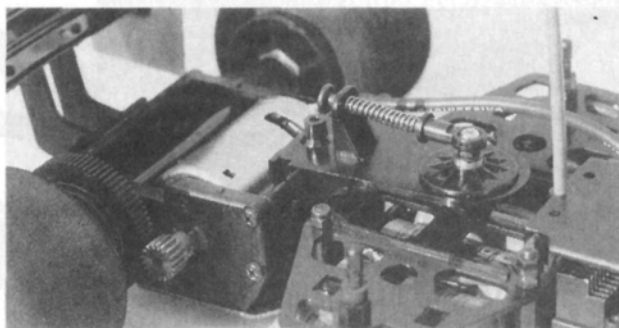
The Jordan F1 done up in the numbers of M. Gugelmin.



Above: the front suspension may look delicate, but it's remarkably durable. It's protected by the tough front wing/bumper.



Above: the rear triple-element wing is very true-to-scale, and it's a good place for a Radio Control Car Action decal, don't you think? Right: the rear suspension has two friction plates and a spring-loaded upper shaft.



(KYOC2885) as an after-market accessory; it's probably a good idea if you want to race your car.

At the front end of the Jordan, a four-piece, plastic A-arm setup holds the steering blocks in place. On-road racers will immediately recognize the familiar spring-over-kingpin front suspension. Watch out for those flying E-clips! Using a micrometer, I determined that the kit's black front springs were 18s—a good starting point.

My car, however, tended to push on the parking-lot test track, so I switched to some Bud's* 16s, and that gave it a lot more steering. The front spindles appear to have at least 5 degrees of caster built-in.

The Jordan's drive train begins with the kit's Mabuchi-type Le Mans 05 motor. The gears are a metric

PARKING LOT RACING

(continued from previous page)

CA, was planning a similar race. And in the San Fernando Valley, Victory Hobbies was not only holding races in a large home improvement store's parking lot, but they also persuaded the store's management to donate the materials for a drivers' stand!

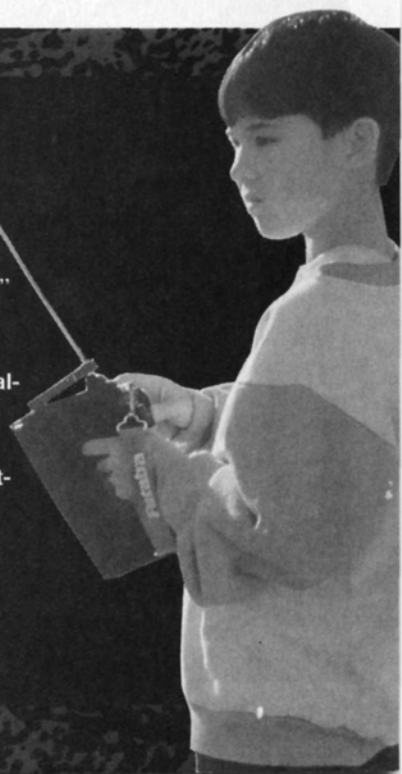
With the public exposure, the spectator turnout was pretty good, too. There was a constant crowd of onlookers who had obviously never seen an R/C race before, and they

were just full of questions, such as "How fast do these things go?" and, of course, "How much do they cost?" And you can bet that more than a few of these onlookers wound up in the hobby shop right afterward!

The new Kyosho and Tamiya F1 kits seem to be the cars of choice in these more-for-fun-than-for-blistering-speed races. To keep the cost of such racing down, rules that prohibit major modifications are being established.

Already, Dan Moynihan (818/700-6912) and NOR-RCA are looking at ways to set up rules for "Box-Stock" racing.

These efforts are being made in an attempt to revitalize entry-level racing, especially at a time when many hobby shops could use a little boost in their business. After all, today's wide-eyed spectator is tomorrow's novice-class racer.



KYOSHO JORDAN YAMAHA F1

48-pitch pinion and spur that yield a 4.1:1 gear ratio (17- to 23-tooth pinions are available from Kyosho). The steel rear axle rides in metal bushings (oil them well!) and holds the 4-bevel-gear diff assembly. A gear diff usually allows one wheel to turn more or less than the other one—the main idea behind a diff—but it doesn't allow you to adjust the initial "slip" on takeoff as you can with a ball-style diff. Kyosho offers a ball differential (KYOC2173) for those who want the greater degree of adjustability.

The rear suspension's main feature is a double "friction-plate" assembly (amusingly called a "friction dumper" on the box) that's similar to those found on many popular on-road cars. Be sure that these plates ride on their post freely; the rear end loses traction suddenly when these plates bind up. I had to ream the lower friction plate slightly to achieve the smooth action I wanted. A spring-loaded steel shaft is mounted on top of the friction-damper post; it maintains the car's ride height but has little to do with its damping.

The kit includes a pair of trued foam tires and some

very scale-looking, textured, black plastic wheels. The instructions tell you to use the supplied double-sided tape to mount the tires on the wheels, but I just don't believe that tape could be as effective as tire cement and a quick dunk in lacquer thinner.

The Jordan doesn't come with a speed controller, but any medium-size ESC will fit very well in the chassis' tight quarters. I used a Tekin* 610 with torque control, a mini-receiver from Novak* and a small Futaba* S-132H high-speed servo. My 6-cell battery packs were built in a side-by-side configuration—not the recommended setup for opti-

KYOSHO JORDAN YAMAHA F1

Scale1/10
Price\$139.95
DistributorGreat Planes

DIMENSIONS:

Overall length16.5 inches
Width7.875 inches
Wheelbase9.875 inches
Track (f/r)7.875 inches

WEIGHT:

Gross (with battery)2 pounds, 10 ounces

CHASSIS:

TypeMolded double-deck
MaterialPlastic

DRIVE TRAIN:

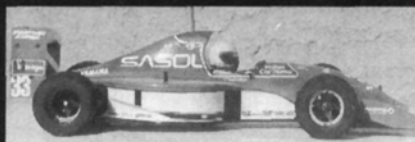
TypeDirect drive
PrimaryPinion/spur
DifferentialGear
Bearings/bushingsBushings

HITS

- Excellent overall scale appearance
- Many hop-up parts available
- Inexpensive, easy way to start on-road racing

MISSES

- Plastic chassis is too flexible
- No bearings
- Axles and gears aren't standard sizes
- Gear diff is noisy; it should be the first thing replaced (with optional ball diff).



SUSPENSION:

Front: TypeFloating kingpin
DampingCoil spring
Rear: TypeT-bar
DampingDamper plates

WHEELS:

Front: TypeMolded F1 style
Dimensions (DxW)1.375x1.065 inches
Rear: TypeMolded F1 style
Dimensions (DxW)1.375x1.75 inches

TIRES:

Front/RearTrued compound foams

ELECTRICS:

MotorLe Mans 05
Battery/speed controller ..Not included



*Here are the addresses of the companies mentioned in this article:
Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Bud's Racing Products, 1575 Lowell St., Elyria, OH 44035.

Tekin Electronics, 940 Calle Negocio #140, San Clemente, CA 92673.

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

SPEEDWORK

GRAND FINALE

AS I DROVE in the rain from Fort Lauderdale to Orlando, FL, on New Year's weekend, I asked myself: "Is this race worth the trip?" Oval racing was new to me, and I really wasn't sure whether I had made the right decision. After all, how interesting can racing in a circle be? As a dyed-in-the-wool off-roader, I wasn't sure what to expect.

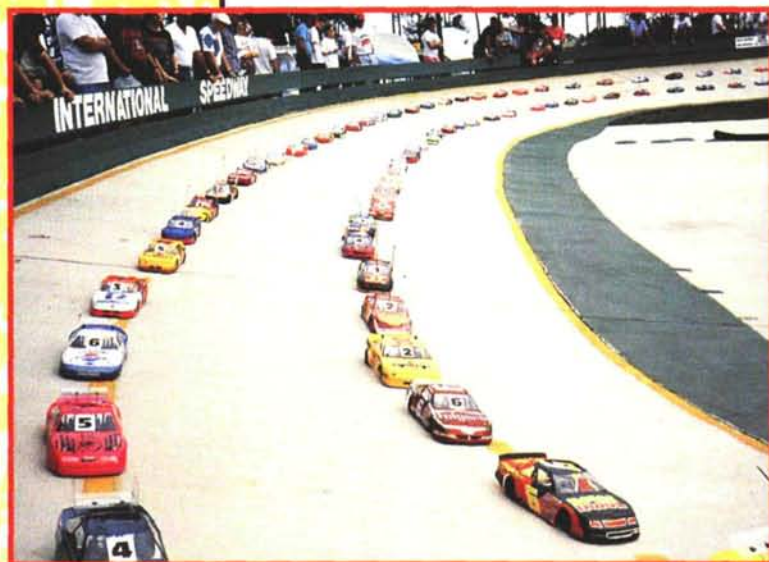
Well, let me tell you, it was worth the trip!

The Speedworks Grand Finale '92 at Lake Whippoorwill Superspeedway was one of the most exciting events I've ever attended. The weather was perfect, the racing was fast and competitive, and "The Whip," as the speedway is affectionately known, is a first-class facility.

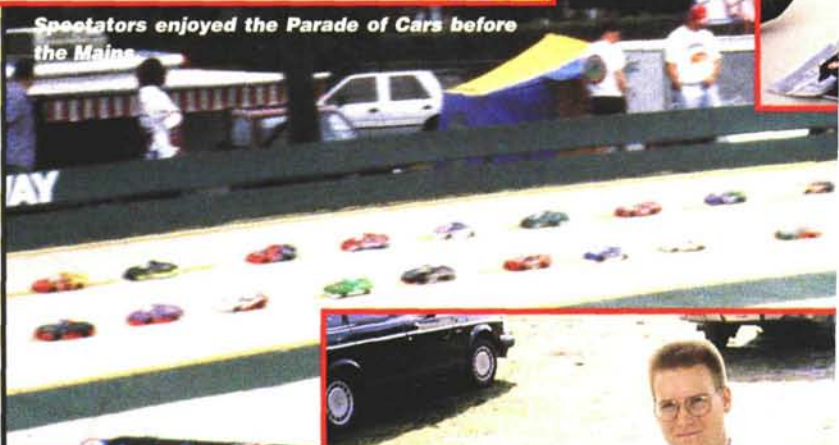
I was also impressed by the track itself. Bob and Yvonne Hosch's beautiful and professional Lake Whippoorwill, in its country setting, is surrounded by orange groves and has a peacock crossing at its entrance.

This race—the last of three in a series sponsored by Sanyo, Trinity, Team Novak and Car Action—provided a format that allowed sponsored and non-sponsored drivers to compete on a separate, but equal level.

More than 130 racers competed, with 92 in Sportsman and 44 in Sponsored Stock. In addition to the main event, a speed run and a celebrity truck race were held to add a little extra spice to an already exciting event.



Spectators enjoyed the Parade of Cars before the Main.

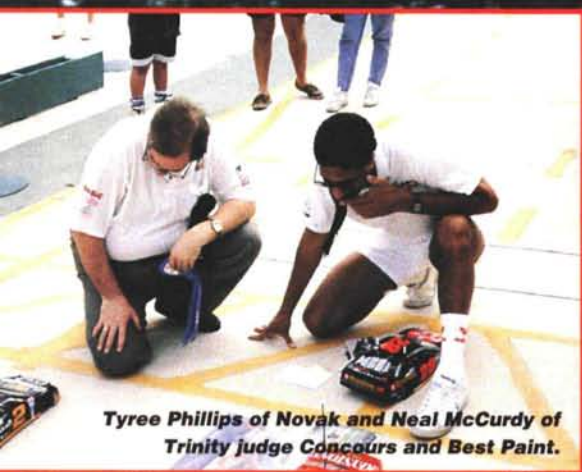
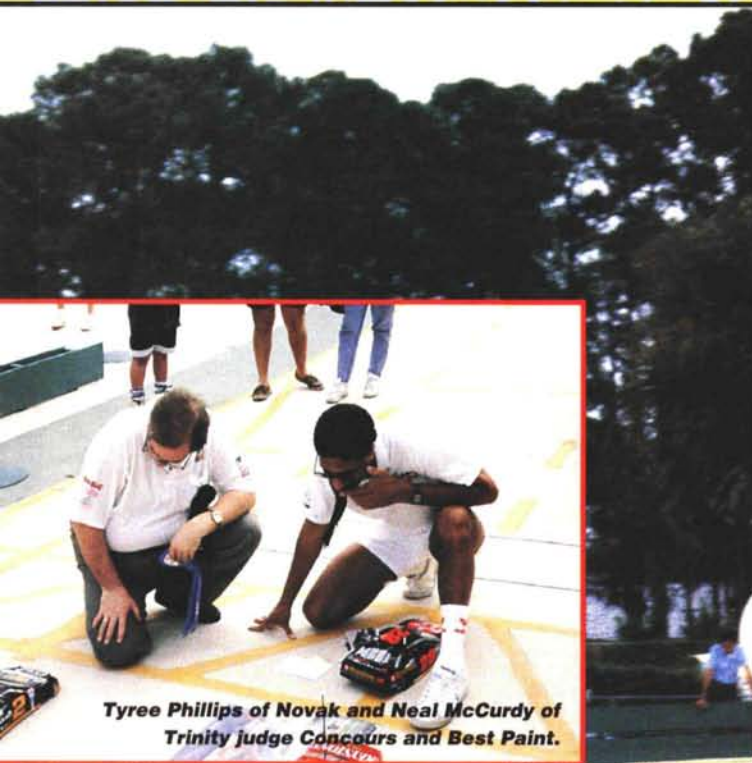


The real thing for Neal McCurdy, Tony Neisinger, Jim Dieter and Joel Johnson is this hot Camaro Stocker.



Joel Johnson in the pits with the Evolution 10 SS prototype, a left-turn-only version of the car with which he won the 1/10-Scale IFMAR World Championship.

WORKS



Tyree Phillips of Novak and Neal McCurdy of Trinity judge Concours and Best Paint.



by RICHARD SCHWARTZ

Ending
with a BANG!



Concours winner Wayne Southard's Keystone and Best Paint winner Chuck Nieman's Raybestos Ford Thunderbird are two sharp-looking models.



Pictured here (from left to right) are the top three A-Main finishers in the Sponsored Stock Class: Tony Neisinger, 3rd; Mike Boylan, 1st; and Andy Dobson, 2nd.



Pictured here (from left to right) are the top three A-Main finishers in the Sportsman Stock Class: Christopher Bimmer, 3rd; Larry Burkett, 1st; and Bob Smith, 2nd.

NEW YEAR'S DAY

On Friday, New Year's Day, the track was open for practice from early morning until 10 p.m. A large contingent of drivers had already arrived, and they made the most of this practice time by familiarizing themselves with the oval. Two things that amazed me about oval racing were the speeds and how close the vehicles came to one another. I learned that when these cars hit the wall or tangle with other cars, the damage can be major—big time!



Bobby Turner and David Sanders of Palmetto Racing traveled all the way from Charleston, SC.

QUALIFYING

Three qualifying rounds were held on Saturday, with a total of 19 heats contested. The motors and batteries were all handouts; this proved to be extremely important as the day progressed.

•**Sportsman Stock.** This class ran first, and the competition was hot and heavy. The better drivers had their hands full because they

had to run against the clock and some newer, less experienced racers. Fortunately, everyone showed good sportsmanship, and the slower cars went high on the banking, when necessary, to let the faster cars pass. Since it was the first qualifier of four, most of the racers held back, concerned with finding the groove and the proper tire and gear setup.

Larry Burkett, Scott Gardner and Howard Baird were the men to beat, and at the end of the first day, they held the top three slots.

Larry Burkett was sitting on the pole—the only driver who had turned 40 laps in 4:03.84.

•**Sponsored Stock.** These drivers immediately put the pedal to the metal. Turning 40 laps was common, with Danny Shaw and Mike Boylan turning 41 laps in the first round. Round three included the fastest run of the day, with Chad Mears turning the only 42-lap run of the event in 4:04.71. Danny Shaw followed with 41 laps in 4:01.94. Mike Boylan, Andy Dobson, Troy Desmarais and Bill Kellum also completed 41 laps.

IS NO LUCK...

Every racer who participates in a big event wants to go home with an award. But Charles Resta from Cocoa, FL, won the award all racers try to *avoid*! After his first big event, Charles took home the "Bad Luck Award" provided by "Rebel" Dan Toll of Winner's Circle Custom Painting. This award is given to the racer for whom everything goes wrong. In the first and second qualifiers, Charles's car lost its wing. (Charles had read *Car Action*'s article on wings, but he had lent that issue to a friend before the race.) He missed the fourth qualifier, and finally, in the Main, his car's front end broke. We all wish Charles much better luck next time, and even though he had a really frustrating weekend, he'll be coming back next year, more determined than ever to make sure the award goes to someone else.

BETTER...



THAN BAD LUCK?



Pictured here are TQ'ers Chad Mears (Sponsored Stock) and Larry Burkett (Sportsman Stock).

LOVE IN THE PITS

Teri and Mike dated for about a year before their marriage, and during that time, Teri went to many of Mike's races. "I knew what I was getting into," Teri said. She did make Mike promise that they would get a motel room and not sleep in the back of the van. Although Mike tried to be calm, cool and collected, the recent wedding must have had an effect on his nerves: he forgot to go through pre-tech for the first qualifier, and he ran the race without a transponder.



Sweetheart, where should we go on our honeymoon? Miami Beach? Niagara Falls? Las Vegas? Lake Whippoorwill? Mike Vasquez and his bride, Teri, decided to forego the more established romantic meccas, and they chose the Speedworks Grand Finale as their honeymoon spot. They were married on December 27, in Ormond Beach, FL, and they settled their priorities early: "The couple that races together, stays together."

SATURDAY NIGHT UNDER THE LIGHTS

On Saturday night, the track was open for limited practice. A barbecue was provided for all the racers, but the technical seminars drew the most interest. Tyree Phillips, of Team Novak, Andy Dobson, from CompositeCraft, and Neal McCurdy, Joel Johnson, Jim Dieter and Tony Neisinger of Trinity and Point Blank answered questions and provided information on new products. The tent was full, and everyone paid strict attention to the sage advice.

Saturday was a full day, and as I drove back to the hotel, I was glad that Sunday's program wouldn't begin until 9:30 a.m.

Sportsman Stock A-Main

Fin	Qual	Name	Chassis	ESC	Radio	Charger	Body	Tires
1	1	Larry Burkett	CC 10LGE**	Tekin 411P	Futaba Magnum	Turbothirty	Protoform T-Bird	TRC Pro-Lites
2	4	Bob Smith	TRC/CC Lynx II SS	Novak MXc	Futaba PCM	Turbothirty	Bolink T-Bird	TRC Pro-Lites
3	10	Christopher Bimmer	CC 10LSS†	Tekin 600PX	Futaba AM	Turbothirty	Bolink Olds	TRC
4	2	Scott Gardner	CC 10LSS	Novak	Futaba	Turbothirty	Bolink Lumina	TRC
5	5	Frank Smith	CC Hyperdrive	Novak	Futaba	Turbothirty	Bolink	TRC
6	9	John J. Maher Jr.	Ass. 10LSS	Novak M1c	Futaba PCM	Digi-Peak+	Ass. Pontiac	TRC
7	6	Steve Vasquez	TRC Lynx II	Tekin	Futaba PCM	HI-IQ	Protoform T-Bird	TRC
8	8	Bud Johnson	CC 10LGE	Tekin	Futaba Magnum	Tekin	Bolink Pontiac	TRC
9	7	Tony Padilla	TRC/CC Lynx II SS	Novak HPc	KO Propo	Turbothirty	Protoform Pontiac	Bolink BSR
10	3	Howard Baird	Ass. 10LSS	Novak	Futaba	Turbothirty	Bolink Pontiac	TRC

Sponsored Stock A-Main

Fin	Qual	Name	Chassis	ESC	Radio	Charger	Body	Tires
1	3	Mike Boylan	CC 10LGE	Novak Hyperfet	Futaba PCM	Novak	Protoform Pontiac	TRC
2	6	Andy Dobson	CC Predator II	Novak	Futaba	Novak	Bolink	TRC
3	4	Tony Neisinger	Trinity EV10SS††	Tekin 411G	Airtronics	Tekin	Trinity	TRC
4	9	Todd Markham	Hyperdrive H10RS	Novak	JR R-756	Hi-IQ	Protoform Lumina	TRC
5	5	Troy Desmarais	CC 10LSS	Novak M1	Futaba	Turbothirty	Protoform Pontiac	TRC Pro-Lites
6	10	Rich Boehmler	CC 10LSS	Novak M1c	Futaba	Digi-Peak+	Protoform Lumina	TRC
7	2	Danny Shaw	Ass. 10LSS	Tekin 600	Futaba Magnum	Turbocharger	Protoform Olds	TRC
8	1	Chad Mears	Ass. 10LSS	Novak HPc	Futaba PCM	Novak	Ass. Pontiac	TRC
9	8	Bill Kellum	Hyperdrive	Tekin	Futaba	Novak	Bolink Pontiac	TRC
10	7	Joel Johnson	Trinity EV10SS	Novak HPc	Airtronics	Turbothirty	Andy's Pontiac	TRC/TM Radials

*Handout motors = Speedworks Superspeedway Stock; handout batteries = Trinity Sanyo 6-cell 1400 packs

**Composite Craft 10L Ground Effects

†Composite Craft 10L Superspeedway

††Trinity Evolution 10 SS Prototype

THE MOMENT OF TRUTH

The first activity on Sunday morning was the final qualifier. This was the do-or-die heat for those who wanted to move up into the A-Main. It was really nerve-wracking for those who had to sit on the bubble and wait for the last qualifier to determine

whether they would stay in their Main or be bumped into a lower Main. In Sportsman, two changes took place: John Maher and Steve Vasquez moved into the A-Main. Steve moved up from the 20th spot to qualify 6th with 39 laps in 4:04.51.

In the Sponsored class, Tony Neisinger

and Rich Boehmler also moved up to fill the A-Main grid.

•**Sportsman Main.** This was as exciting as they come. TQ'er Larry Burkett was taken out on the second lap, and he fell about three-quarters of a lap behind Bob Smith. In oval racing, that can be disastrous. Burkett didn't give up, though, and from that point on, he drove an almost perfect race, passing Smith on the final lap to take the checkered flag. I've never seen a happier guy in my life. As soon as he stopped shaking, he told me that he knew he had more speed than Smith, but he was most concerned with driving a smart race and finishing. For Burkett, the win was a dream come true, and his smile lit up the track.

•**Sponsored Stock Main.** This was the big race of the day, and the spectators saw oval racing at its highest level. Unfortunately for TQ'er Chad Mears, his 42-lap qualifier was for naught, since his car was demolished on the first lap. The race developed into a two-man affair between Mike Boylan and Andy Dobson, with Boylan using all his driving skills to fend off a hard-charging Dobson. Boylan won with 41 laps in 4:04.95, and Dobson placed 2nd with 41 laps in 4:07.09.

•**Trinity Speed Run.** This was the last event of the day—the no-holds-barred, see-how-fast-you-can-go competition. Mike Boylan pulled a double for the day by winning this event with a 4.46-second lap at 56mph. He ran an Associated 10L Ground Effects car with a Twister 12-turn triple, 10 1400

GO GET 'EM,

Every time I attend an R/C event, one thing is lacking—female racers! For whatever reason, the sport hasn't been able to attract the ladies. Fortunately, the Speedworks Grand Finale was attended by two young ladies who represented their gender splendidly. Dawn Delp, a fifteen-year-old from Fort Pierce, FL, ran in the Sportsman Stock Class. Dawn has been racing for five years. She drives an Associated 10L and also races off-road. She became interested as she watched her father and uncle participate. Her father, Ken, stopped racing to handle the team's pit duties, and he supports her effort 100 percent. Dawn says she really enjoys the competition and just thinks of herself as "a racer," not a girl against the guys. She says that she receives no special treatment and is "definitely not intimidated by the men."

Representing the Sponsored Stock Class was Jill Simms, one of the Simms racing family. Jill's dad, Phil Simms, also raced in the Sponsored Class, and says Jill, "He gives me the best stuff for my car." She has been racing for almost seven years, having also become interested when she attended races with her family. Jill says she loves the competition and finds that the "guys try harder," rather than offering her any special treatment when she races. In addition to oval racing, Jill runs in off-road, on-road and drag racing. Her actions spoke for themselves as she finished 8th in the C-Main. Jill is sponsored by CompositeCraft, Novak, TRC, Bolink and East Coast Motors. I hope that other women who attend these races as spectators will see Dawn and Jill on the drivers' stand and realize that R/C racing is for everybody.



Jill Simms works on her car in the pits.

Ladies



Sponsors

Twister, Team Smooth, Assoc., Composite Craft, Protoform, Novak, TRC, Rally Auto

Composite Craft, Trinity, TRC, Novak, Futaba, Bolink

Point Blank, Tekin, TRC

Hyperdrive/PTI, Parma/PSE, Vantage, Victor, Cannon, Bob's Hobbies

Twister, Team Smooth, Doc's Indoor Raceway, MTS

TD's Hobbies, Robinson Racing, Boca Bearings, Ice Pack Racing, Cannon

Cannon, Bad Dog, CAM, Protoform

Cannon, CAM, Novak, Bad Dog, Assoc., Competition Electronics, Team Smooth

Hyperdrive, TRC, Bolink, Team Smooth, Trinity, Cannon, Composite Craft, Bad Dog

Trinity, TRC, Novak, Magic Motorsports, Cellular One

WINNERS

FAIR IS FAIR!!!

One of the great things about "big" races is the opportunity they give to run with the pros. The people you read and hear about stand next to you on the drivers' stand, and you know you may have a chance to pull off the "big upset." Reality, though, usually sets in after the qualifiers, and you find yourself in the D-through-Z-Mains.

The Speedworks Sportsman Cup sponsored by Sanyo, Trinity and Team Novak changed that format. The Grand Finale held at Lake Whippoorwill Superspeedway provided classes for sponsored and non-sponsored drivers. It's a great concept: it allows you to mingle with the big boys and also to race against drivers of your own skill level. This idea should be used to promote equity and fairness in future major events, in all of the classes of R/C racing. The youngsters who are just starting out—the future of this sport—need to know they have an opportunity to compete successfully in a major race.

SCRs and a Novak speed controller. Troy Desmarais took second with a 4.98 second lap.

THE DAY IS DONE

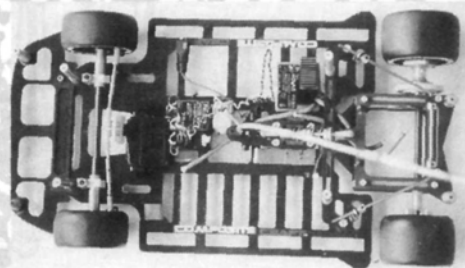
As I packed up to head home, I knew I had made the right decision in attending this race. The people were great, the action was exciting, and the three days flew by. (In fact, the only disappointment all weekend was the cancellation of the seafood buffet at the Holiday Inn on Friday. What a bummer!) I also left with a new respect for oval racing. It takes as much, if not more, skill than off-road racing. As I drove through the gates, I wondered which oval car I should buy. ■



WOLFE MOTORSPORTS

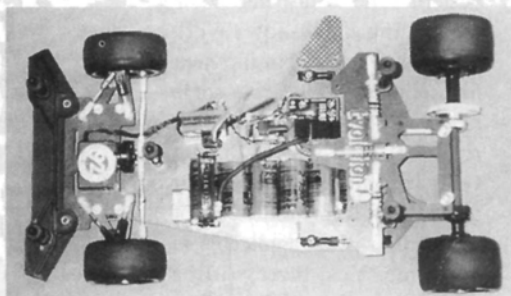
Wolfe Motorsports showed a couple of really neat new items that were simple in design, but highly functional. The first was a little fan blade that fits onto the motor shaft to provide cooling when you're breaking-in your motor. Since you won't need an external cooling source when you use the fan blade, you'll have fewer extra gadgets in your parts box. The second item that really impressed me was a motor break-in stand that was designed specifically to hold a Dremel tool instead of a slave motor. This allows you to maintain a continuous rpm level as you break-in your stock motor bushings.

NEW IN THE PITS



COMPOSITECRAFT PREDATOR II

CompositeCraft introduced a completely new car—the Predator II. Andy Dobson—a well-seasoned racer and director of R&D for CompositeCraft—thoroughly explained what makes this car different. It has a graphite/magnesium front crossbar, adjustable front and rear track, a rear anti-roll bar and a floating rear suspension. The rear suspension—called a "barrel and trunion"—looks complicated, but it's really very simple in design and function. It pivots on two ball bearings so that the chassis can flex. Andy explained that this vehicle was designed to be ready to race right out of the box—easy to work on and requiring little maintenance. The three Predator II chassis available are the LTO, Ground Effects and On-Road.

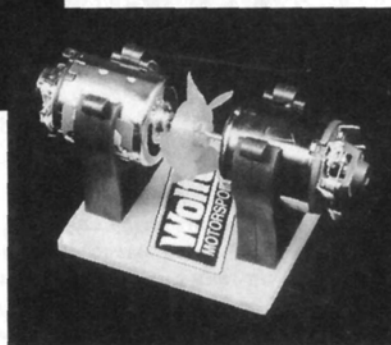
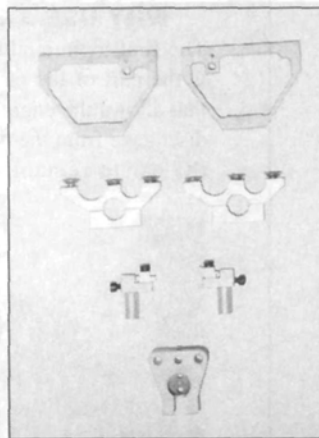


TRINITY EVOLUTION 10 OVAL

Trinity introduced its first car designed exclusively for pavement oval racing. The company's Joel Johnson and Jim Dieter elaborated on the oval-only car's many new features. The rear end houses the "Triad rear damping system" with its three shocks. The front end has reactive caster to improve steering. The chassis is made from zero-flex 0.110-inch thick graphite. The kit comes with full ball bearings, hollow graphite axle and a Pro differential. A nice feature is that the position of the battery can be altered. According to Neal McCurdy of Trinity, this kit comes with everything needed to build a state-of-the-art oval car.

RACEWAY MFG.

(Right) Raceway Mfg. of Ormond Beach, FL, unveiled some brand new products that will improve your oval car: an aircraft aluminum support that eliminates suspension arm flexing; an axle beam mount for Associated-type cars, and beam axles available with 0 to 4 degrees of camber; a nifty wing/swaybar mount that will accommodate 0.062-, 0.078- and 0.093-inch swaybars; and finally, a chassis support/shock mount for the 10L or 10L SS. These parts are all top quality in design and manufacturing.



NITRO NEWS

CLUTCH CLUES

by JEFF BRONSTEIN

SINCE THE beginning of "Nitro News," a number of hard-core racing addicts (you know who you are) have been pestering me to dispense some real racing know-how. Well, OK, gas guzzlers; in the next few months, we'll tackle some heavy performance tips. On-road, off-road, truck, buggy, GTP, or monster truck—it doesn't really matter. Most of these tips will be applicable to everyone. Yes, there will be some topics that might go just slightly over your head. If so, duck! But don't worry. Keep each issue of *Car Action* (as you should, anyway) until your racing experience catches up with your lofty ambitions.

WHY USE A CLUTCH?

The first topic is clutches. A clutch is the part of the car's transmission that allows the engine to engage and disengage from the wheels. It allows the car to remain still while the

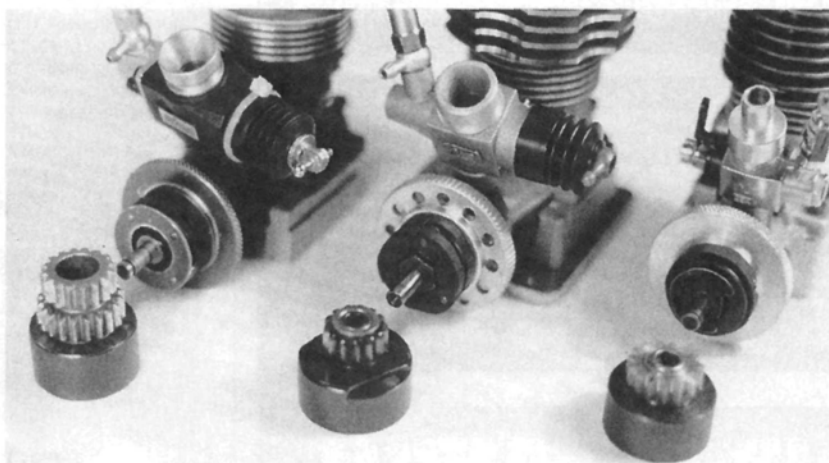
engine is running. Different clutch setups, however, can also affect acceleration, engine performance and even fuel economy. In most cases, the original clutch will produce sufficient performance, but in this growing pack of nitro speed hounds, "sufficient" doesn't even

come close. I like to get as much power to the ground where I can use it, and I like to do it as soon as possible.

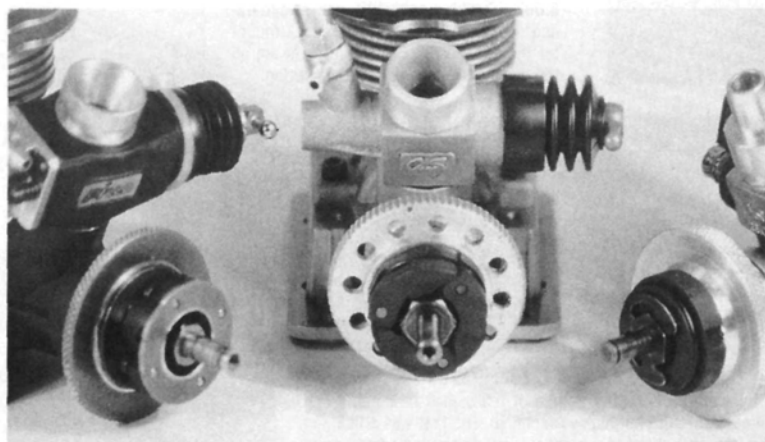
CLUTCH BASICS

Although there have been some interesting improvements in clutch designs over the past few years, most clutches are very simple. The flywheel and clutch are mounted directly on the engine-output crankshaft. Surrounding the clutch is the clutch-bell and pinion assembly. The simplest clutch setup uses two or three arc-shaped "shoes" that pivot between the flywheel and the clutch bell. As the engine begins to accelerate, centrifugal force drives the shoes away from the clutch and into contact with the inside of the clutch bell. Friction between the shoes and the bell housing engages the transmission and drives the wheels. When the engine slows again, the shoes lose their grip, and the clutch disengages.

Unlike a full-size car's clutch, the



The two basic components of the clutch are the clutch bell (foreground) and the clutch shoes. Although these three engines are used for very different types of racing, their clutches are alike.



There are many clutch arrangements. Left: an on-road engine that uses four spring-loaded clutch shoes in an advancing configuration. Center: an off-road buggy engine that uses three spring-loaded clutch shoes in the conventional trailing configuration. Right: a 1/10-scale engine that uses a two-shoe setup with a rubber O-ring to load the clutch shoes.

centrifugal clutch usually disengages every time the engine slows and then re-engages when it accelerates. This makes clutch tuning vitally important when you're racing.

ANNOUNCING THE ENGAGEMENT

So far, it all sounds very simple, but the most important aspect of the clutch is *how* it engages the transmission. Everyone has seen a poor driving-school dropout accidentally pop the clutch at a stoplight and kill the engine. That's what happens when the clutch engages too quickly.

When the centrifugal clutch in a gas car engages too quickly, it "bogs" the engine down before it can develop power. The engine note drops suddenly, then slowly comes up to speed. You might mistake it for a low-end carburetor adjustment problem. The car lacks "snap" or "punch" coming out of the corners. At the extreme, the clutch may not allow the engine to idle when the car is at rest.

At the other extreme, if the clutch engages *too* slowly, the engine whines and *sounds* powerful, but the car crawls away as if it has a loose diff. This is definitely undesirable during a race, unless it's the other guy who has this problem!

WEIGHT WATCHING

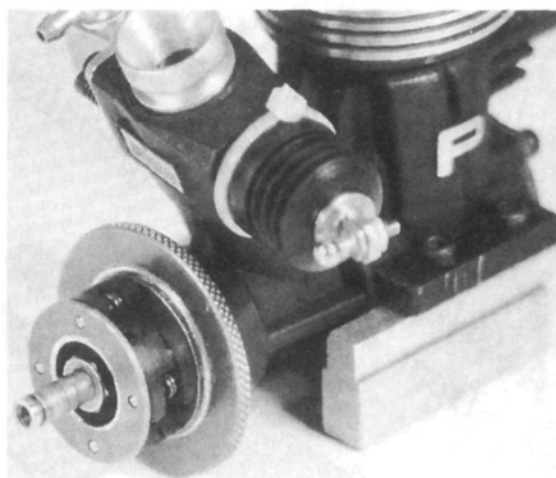
The weight of the clutch shoes determines how quickly the clutch will engage. Heavier shoes engage the clutch bell more quickly, because there's more weight for the centrifugal force to act on. If you remove material from the clutch shoes, they'll usually slip inside the clutch bell until the engine reaches higher rpm and more power. It's like taking your foot off the clutch and simultaneously stepping on the throttle. When clutch shoes are lightened, the unwanted material is usually removed from the inside of the shoe or

at an angle along the tail, and this also reduces the shoes' contact area. Many racers still use this distinctive, lightened "comma-shaped" clutch shoe with excellent results.

Although lightened clutch shoes do wonders to improve engine response, they frequently don't engage the clutch bell fully. Slipping inside the bell housing, they generate excessive heat—even to the extent of discoloring the metal.

I use the term "relative weight" because newer racing clutches use small springs or O-rings to hold the shoes, and this makes the shoes *feel* heavier. A heavier shoe with a little tension placed on it will still engage the clutch bell later, like the comma-shaped shoe, but it will engage with more authority and less slippage. It's kind of like revving the engine up and popping the clutch at the same time. The tension from the spring is always constant, but the centrifugal force on the weight of the clutch shoe increases exponentially (that means it's stronger). The result is "crisp" acceleration off the line and out of tight corners.

Better yet, the springs have some excellent "side effects." As the engine slows down, the clutch disengages completely and more quickly, and this



The lightweight flywheel and clutch shoes become one unit when they're installed on the engine's crankshaft. Although the tires might turn only 6,000 or 7,000 times per minute, the clutch might spin as much as 20,000 or 30,000 times per minute.

allows easier braking, better fuel economy and cooler running.

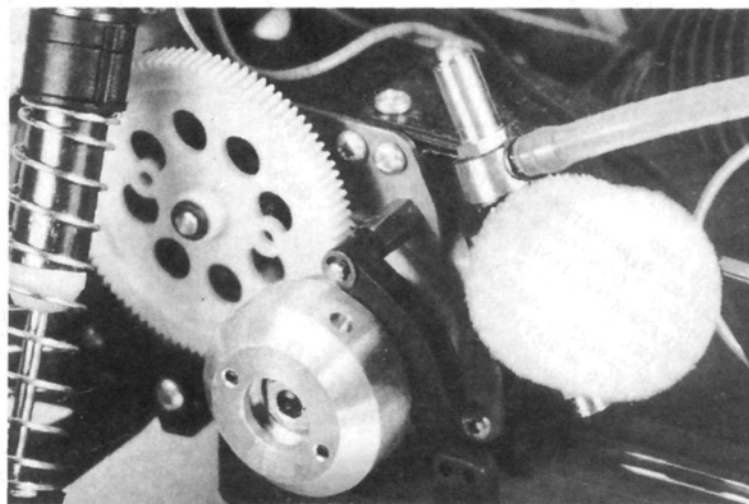
HOT SHOES

As the clutch shoes engage the clutch bell, they contact only a very small patch of the clutch bell's surface. To increase the area that's contacted, use more shoes: three clutch shoes can cover more area than two, and four more than three, and so on—sort of like getting more kids to push the merry-go-round.

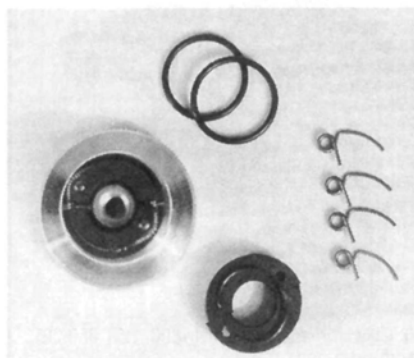
More clutch shoes will produce an even quicker response from the clutch and a more solid hold on the clutch bell. Some racers like to use fewer shoes because it can help to prevent the car's

tires from breaking loose. I don't generally recommend this practice. It's better to rely on your ability to limit the torque with your throttle finger rather than to build "excessive" slippage into the clutch.

Learning to use the throttle correctly is difficult, but it's essential to gas racing. There are no torque limiters, slipper diffs or hydro-whatchamacallits. Don't make the



It's difficult to work on the clutch when it's installed in the car. When you remove the engine for inspection and maintenance, don't forget to check the clutch shoes and the bell housing.



There are also several ways to load the clutch shoe—from rubber O-rings to peculiar-looking springs. Shoe loading allows the engine to develop power before the clutch engages.

clutch do your dirty work (this has been the "Nitro News" editorial comment of the month).

REVERSING SHOE DIRECTION

In most cases, the clutch shoes trail behind the pin in the direction of the engine's rotation. If you turn the shoes around in an advancing configuration, however, the clutch will generally engage more quickly. Under the right conditions, this can be a killer strategy, e.g., when there's plenty of traction and lots of power. Make sure, however, that the rest of the drive train can handle the continual jarring produced by this type of setup. It's not uncommon for a 2-speed gear or diff to give out under the strain.

ADJUSTMENTS AND MAINTENANCE

When you've found a good clutch arrangement, only minor adjustments and routine maintenance will be necessary. Inspect the clutch shoes occasionally for wear, which might cause inconsistent performance. If the shoes are glazed or shiny, scrape the contact surface carefully with a sharp hobby knife. Clean the inside of the bell housing occasionally so that dust and debris doesn't build up.

You can upgrade most cars to a spring-type clutch, or, with a little ingenuity, you can build one. Getting a clutch engaged is easy. Of course, I know a girl in Texas who was engaged in three states...but that's a different story!

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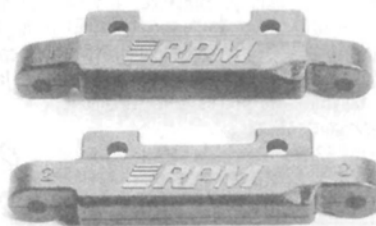
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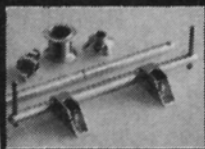
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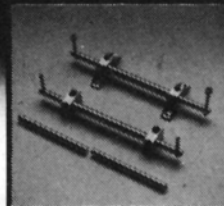
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Building Andretti R/

by CHRIS & DEBRA ACKER

SCALE INDY CARS

I decided to build replicas of Mario and Michael Andretti's Indy cars—one for oval racing and the other for on-road racing. For the oval car, I chose Bolink's* LTO Quick Change, and for the on-road car, I used Bolink's California Flyer.

LTO QUICK CHANGE

In Indy-car racing, chassis setup and aerodynamics are critical. When Indy cars race

These two Bolink cars are fashioned after Mario and Michael Andretti's race-winning Indy Cars.

PHOTOS BY DEBRA ACKER



Mario and Michael Andretti are a father and son team who learned that working together gave them more than just victo-

ries; it gave them a great relationship. When I heard that Michael Andretti was leaving the Indy-car series for a Formula 1 ride overseas, I

decided to ask them how racing together had affected them.

I asked Mario if he thought it was good for young kids to

FATHER & SON RAC



Replicas

at the Indianapolis Motor Speedway, racing teams set up the cars with what they call a low-drag package. The front spoiler and the rear wing have a much smaller surface than that of an on-road car. The package also includes modified side pods and an underbody that's designed to provide low drag.

The oval track car I chose was the LTO quick change. For those of you who are new to the sport, LTO stands for "left turn only." The car's setup is arranged so that the majority of the weight—the batteries—is on the left-hand side of the car. This car will run well on R/C superspeedways such as the Thunderdrome. Because of its narrow chassis, the LTO can accommodate aerodynamic, narrow bodies that have low drag.

Bolink's LTO is competitive right out of the box and needs few modifications. It has a graphite chassis, and a quick-change battery

IN CASE YOU have forgotten, Father's Day is just around the corner. Instead of buying your father another tie, or another set of golf balls, here's an idea: why don't you get him an R/C car? Dead broke? Take him to an R/C race. After he sees how much fun R/C racing is, he might buy a car for himself. If you're skeptical about your father's interest, show him the "Family Racing" article in the July '92 issue of *R/C Car Action*.

What could be better for Father's Day? You'll get to spend more time with your dad (doing something you both might enjoy); you'll have something in common to talk about; but most of all, the two of you will learn how to race and become teammates—just like the famous father and son team of Mario and Michael Andretti.

system that allows super-fast pit stops. Because the kit's front end didn't allow me to make both caster and camber adjustments, I added Bolink's new independent front end.

REAR END

For the rear bulkhead (rear end), Bolink uses their Aluma-Lite Pod—a strong, lightweight, one-piece aluminum motor pod. You can adjust the height of the axle by switching the bearing flanges. Although the Aluma-Lite pod acts as a heat sink for cooling the motor, I've always been sold on external heat sinks, so I added a Litespeed* litesink.

get involved with their fathers in hobbies like R/C: "I think a lot of these hobbies where fathers and sons can play together and measure up to

each other and compete against one another are wonderful...I really do. I think it gives

you a sense of purpose, challenge and, ultimately, what better way is there to bring a father and son together?"

Mario said that hobbies such as R/C allow kids to spend more time together and to have a reason to do so. He added, "Kids usually get into trouble when they have idle time. When they don't have that sense of purpose, they

just look for other things to create excitement—which is normally the wrong type of excitement."

Mario and Michael Andretti were brought together by fate; it wasn't something that was planned. As Mario explains, "We let everything take its course. Michael established himself first, and later, we decided to team up. When he

came on the team, he came on as a totally separate entity with what he could bring to the table. Because of that, he came on with a lot of strength. He didn't have to ride on my coattails...and I didn't have to worry about holding his hand. It was the best possible scenario we could have asked for."

There was little conflict

After racing together for four years in the Indy-car series, the father and son team of Michael and Mario Andretti are splitting up, and Michael is going overseas to race in the popular Formula 1 series.



Building Andretti R/C Replicas

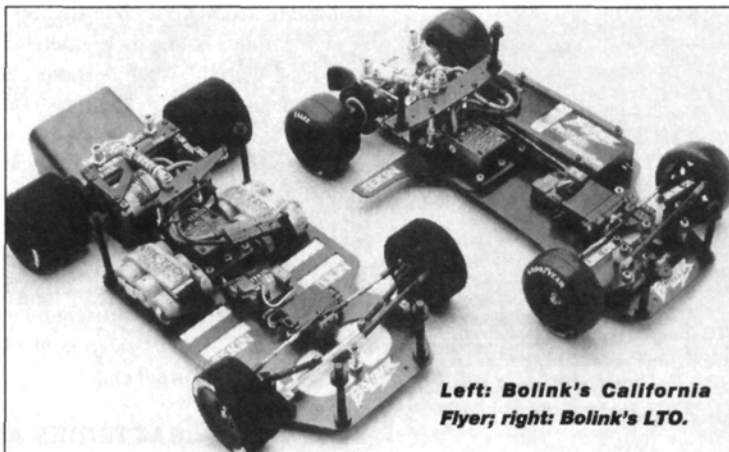
I chose a Quarter Flash* modified 12-turn-double motor. The 48-pitch pinion and spur gears put the power to Bud's* ceramic diff rings and high-precision diff balls. I exchanged the stock thrust bearing for a precision bearing and a Bud's thrust cone kit. To protect the spur gear during rear-end collisions, I added a Bolink spur guard.

RAW ENERGY

For power, I went to the guys at Ballistic Batteries* (they built the batteries for Gary Hamilton's 85.02mph run at the Thunderdrome) for Sanyo's new 1700 SCRCs. These batteries have the characteristics of SCEs, but they can be charged over and over, like SCRs.

GLITCH-PROOF RADIO

The only thing I didn't like about my Airtronics* Caliber transmitter and the Tekin* receiver was that I was unable to blame my erratic driving style on glitching. The receiver is very compact and light. Don't let this little package fool you; it's very sensitive, but it's built to last. On the Airtronics transmitter, adjustments are made on the front panel, which has a digital display. It also includes a stopwatch and a down timer.



Left: Bolink's California Flyer; right: Bolink's LTO.

SPACE-AGE SPEED CONTROLLER

I installed a Tekin TSC-410K computer-controlled ESC. It has a keypad for adjustments and programming, and three timed current settings that allow you to set up your car for different racing environments.

STEERING AND CONTROL

I used an Airtronics 94151 steering servo. It has 75 ounces of torque and moves 60 degrees in .08 second. Tecnicraft* tie-rods connect the servo to the front steering blocks. The front wheels shuddered when the car went through corners, so I installed a Bolink stabilizer on the left steering block. The LTO has holes already drilled in the front end that provide a sturdy in-line mount. I used Bolink's capped radial tires in a staggered pattern, and mounted the rears on Tecnicraft super-light hubs.

GROUND EFFECTS CALIFORNIA FLYER (ON-ROAD CAR)

When Indy cars race on a roadcourse track, such as the Laguna Seca in Monterey, the racing teams install a high-downforce package. The front spoiler and rear wing have a greater surface area, and the side

FATHER & SON RACING

between Mario and Michael while they were teammates. Mario commented on what he was going to miss most about racing with Michael: "I think the camaraderie that we had. The fact that we could travel together, share in a lot of things and really discuss setups, and all the things you normally don't do even with a teammate (or at least that openly). It's quite a luxury to be able to discuss the pertinent things with your teammate. All that is not going to be there anymore. We were very fortunate to be teammates." Looking back, Mario recalled, "I thought it would have been the best possible scenario that we could create for ourselves. It's something that we couldn't have even

begun to plan for. It was either going to happen or not, and it did. Some things are so far-fetched and the logistics of it are so difficult, that if you plan it, it would never work out."

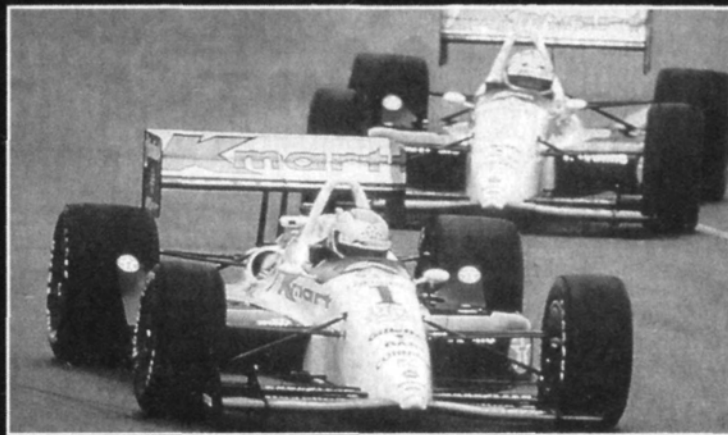
MICHAEL

Michael remembers: "Racing with him as a teammate has really spoiled me in the sense that we were really open with each other, and we tried to help each other out. Whereas now, if you're going to have somebody else in there that isn't blood, you're going to have to be a lot more selfish. It's just not going to be as much fun. What we experienced those four years is something that neither of us will ever experience again."

LOOKING BACK

I asked Mario when he knew that Michael could become a champion and race Formula 1. He responded, "He always

told him was the same thing people always told me: 'Cool your heels, just cool 'em down.' That's when I knew that he had it all going for

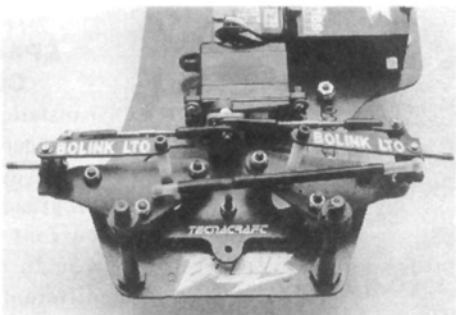


seemed to fly with it. Back in go-carts the first time I saw him I just knew...this kid, he's just going to go places. This was just what he wanted to pursue. The only thing I ever

him." Michael began setting student records and showed he had what it took to become a champion. Mario explains: "After go-carts, everywhere he went, he set student records.

Building Andretti R/C Replicas

pods and underbody have been modified to give more downforce. For the road-racing car, I started with a Bolink California Flyer. It's very easy to build, and it doesn't take a lot of work to set it up for competitive racing. I decided to experiment with some ground-effects technology on the R/C track.

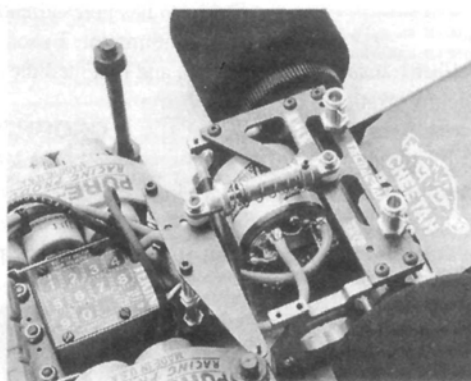


The Bolink LTO car has Bolink's new independent front end and a set of Tecnacraft's tie-rods. An Airtronics 94151 servo handles all the high-speed left-hand turns.

AERO ADD-ONS

To start this experiment, I installed Tecnacraft's Aero Trac kit—a two-piece aluminum rear bulkhead with a graphite support brace. It takes the place of the stock rear end, and it comes with a Lexan venturi that is mounted under the rear end and extends toward the rear of the car. The air that's channeled through the venturi tunnel is accelerated and expanded, creating a low-pressure area that sucks the rear of the car to the ground. You'll find a similar design on the side pods of an Indy car.

To tune for handling, trim the length of the venturi for maximum downforce. If the car understeers, simply trim the tunnel until the desirable level of steering is met. It's handy to have a few venturis of different lengths for the various tracks you run on. The venturi can be



A Tecnacraft Aero Trac kit—a two-piece aluminum rear bulkhead with a graphite support brace—replaces the stock rear-end assembly on the California Flyer. Inside is a Quarter Flash 16-turn, double-wind motor.

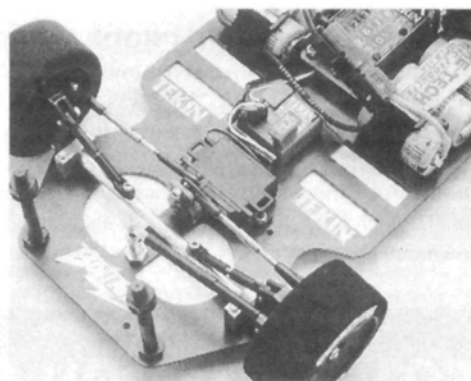
painted to accent your body's colors.

The strong, light, stock graphite axle mounted nicely in the new bulkhead with the stock bearings and flanges. Tecnacraft super-light hubs put the power to the rear-mounted TRC* ZR-1 Pro-Cuts gold dots.

Unfortunately, the kit's front end didn't allow caster and camber adjustments. I installed Cheetah's* ultimate front end, which is built of aircraft alloy. It comes with clear instructions and a fiberglass template for drilling the chassis. I bolted an Airtronics 94143 high-speed servo to the stock holes in the chassis. It has 33 ounces of torque and moves 60 degrees in .09 second. Tecnacraft tie-rods connect the servo to the Cheetah's steering blocks, and TRC ZR-1 Pro-Cuts gold dots finish off the front end.

BATTERIES AND MOTOR

I powered the California Flyer with Ballistic Batteries' Panasonic P-170s, and I connected the batteries with Litespeed's super connectors. They provide a very tight, positive connection with little amp drop. I installed a Quarter Flash 16-turn double with a 15-tooth pin-



The Bolink California Flyer is equipped with an Airtronics 94143 high-speed servo, Tekin electronics and Ballistic batteries.

FATHER & SON RACING



He went to Bertil Ross and Skip Barber in Europe. I think when I sent him to Europe is

when I got the strongest signal that he had some talent that was above average."

WE CAN LEARN FROM OUR TEAMMATES

Michael explains, "He was never one to give advice. He was there more *after* I had had an experience, to answer my questions. If he had given advice, I wouldn't have known what he was talking about anyway until I actually experienced it. It's after I have an experience that I come back to him with a million questions." Michael didn't have to be a winner for his dad to be proud of him: "I don't only measure my pride with success, I measure my pride with commendment," Mario says. "Sometimes, the real character of a person is shown. I was

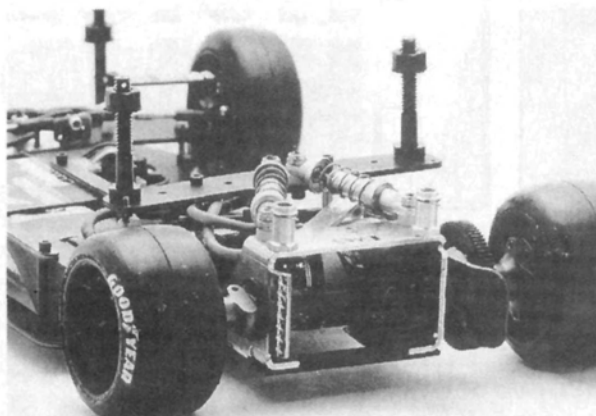
probably more proud of him in the way he behaved after losing Indianapolis than after winning the championship the year before."

What has Michael learned from Mario that he will take to Formula 1? "Something that I've always learned from Dad is to give 110 percent. Drive as hard as you can all the time. That's what I've always done and that's what I hope to take with me."

I hope that this has given you an idea of how father and son racing can be rewarding. Fortunately, R/C racing is a little more economical!

A Quarter Flash 12-turn, double-wind motor and a Litespeed litesink are installed in the rear, one-piece Aluma-Lite Pod.

ion and a 48-pitch, 89-tooth spur gear. I used Bud's diff rings and precision diff balls. Again, I exchanged the stock, outside thrust bearing and washers for Bud's thrust cone kit.



PAINT AND DETAIL

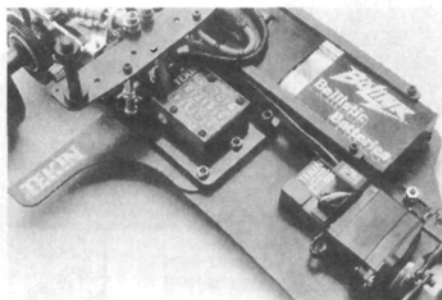
For both cars, I used Bolink's Lola Indy-car body—the fastest Indy-type body at the Thunderdrome last year. The incredibly realistic Kmart Havoline paint job was recreated by Scot Bich of Bich'n Bodies*. Scot used vinyl cut graphics from Custom R/C Graphics*. He reversed the graphics and applied them to the inside of the body before he painted it. The stock wings were trimmed off the bodies and were secured to the cars with Davis Motors Sports* Wing Locks.

THE TEST

The California Flyer is a very smooth car; the handling is predictable and stable. The Tekin speed controller is smooth while accelerating and braking. Because I trimmed a little too much off the venturi (making it ride too high), the ground-effects pod didn't give any noticeable improvement at first. After I lowered the pod (by adding a spacer between the rear support rod), the car actually stuck a little more. The TRC gold dots worked nicely on the clean asphalt. I tried them on a dusty parking lot, and they hooked up well there, too.

Unfortunately, I was unable to test the LTO on a banked oval. (I used the testing area that I used for the California Flyer.) First, I tried its quick-change battery system; it allowed quick pit stops without any prob-

lems. Next, I did some off-the-line tests. The car launched each time with very little loss of traction. Then, I set up a small left-turn oval. All I can say is that this car sticks in the corners! Coming down the straights was a little tricky because I had the front end set with so much caster. But after a while, I got the hang of it.



Tekin's TSC-410K computer-controlled ESCs and mini FM receivers are used in both cars.

So there you go—two cars built to go, and boy, did they ever! If you want to spend more quality time with your father—or your son—give racing a try. Who knows? Maybe the two of you will someday go on to compete against Mario and Michael.

**Here are the addresses of the companies mentioned in this article:*

Bolink R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.

Litespeed, P.O. Box 4765, Spokane, WA 99202.

Quarter Flash Motors, 1143 N. Winstel, Tucson, AZ 85716.

Bud's Racing Products, 1575 Lowell St., Elyria, OH 44035.

Ballistic Batteries, 11725 Gerald Ave., Granada Hills, CA, 91344.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Tekin Electronics Inc., 940 Calle Negocio, San Clemente, CA 92673.

Tecnacraft, 1335E Dayton St., Salinas, CA 93901.

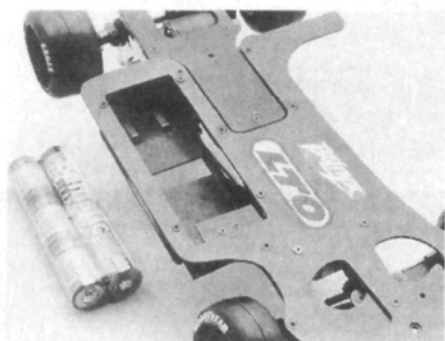
TRC, 2211 Charter St., P.O. Box 1058, Albemarle, NC 28002.

Cheetah Racing, 10823 Amestoy Ave., Granada Hills, CA 91344.

Bich'n Bodies, 4903 Cloverfield Dr., Pearland, TX 77584.

Custom R/C Graphics, 4138 Boston Rd., Bronx, NY 10435.

Davis Motor Sports, 750 Mobil Ave., Camarillo, CA 93010. ■



The LTO has a quick-change battery system that allows you to make super-quick pit stops.

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RACER NEWS

WORLD CLASS RACING

This news is so hot that I'm writing this on the plane ride back to Connecticut just so you can read it here first!

As you know—unless you've been living under a rock for the past four years—the annual **Florida Winterchamps** off-road race, which is put on by the excellent **West Coast R/C Club** in Tampa, is the hottest dirt race in the world (next to the IFMAR Champs). If you're fast in off-road, you'd better be in Florida!

In the super-competitive **2WD Stock Class**, it was a Team Losi battle all the way as **Mike Fletcher** battled it out with **TQ Todd Lewis**. Fletcher's **JRX-Pro SE** took the win with a last-minute pass that had the crowd going wild.

Modified Truck action saw the **RC10T** of Team Associated's **Mark Pavidis** take not one, not two, but all three of the triple A-Mains. Mark battled a tough field, including **TQ "Little" John Walters** of Team Traxxas. Way to go, Mark!

In the **4WD Modified** class, Germany's own **Jürgen Lautenbach** put his LRP-powered **Schumacher BossCat** in the winners' circle, fighting back a hard-charging **Derek Furutani**, whose "Dukeomo" was also powered by LRP. Do I need to add that Jürgen was also TQ? I thought not.

In the "big bananas" class (**2WD Modified**, of course), **Top Qualifier Scott Hughes** and his Reedy-powered **Associated Team Car** just couldn't shake the dreaded TQ jinx, as Scott was held to a second-place finish behind **Associated** teammate and Florida resident "Bad" **Brad Reelfs**. What a race, man!

Couldn't make the Winterchamps? Don't worry, you needn't jump from that open window; just pick up the August '93 issue of *Car Action* for contributing author **Rick Schwartz's** in-depth coverage. It's the next best thing to being there!



FLORIDA WINTERCHAMPS WINNERS!

WE'RE IN AN UP-ROAR

Hey, for all you racers who have been patiently waiting, here are the **tentative dates** and locations of this year's upcoming **ROAR Nationals**:

5/26-30		1/10-Scale Paved Oval Nats, Lake Whipoorwill, FL
6/2-6		1/10- & 1/12-Scale On-Road Nats, Orlando, FL
6/10-13		1/8-Scale Gas On-Road, Las Vegas, NV
6/17-20		1/10-Scale Dirt Oval, Chatham, VA
7/7-11		1/10-Scale Off-Road, Fountain Valley, CA
8/18-22		1/10-Scale Off-Road Trucks, Grand Rapids, MI

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PROCAR SCHEDULE

PROCAR World Series Qualifying April/May Schedule

DATE	TRACK	STATE	PHONE
4/25	Ameri-Trac	IL	(217) 234-8707
5/1	D&S Hobbies	OH	(216) 354-2112
5/1	Lake Whipoorwill	FL	(407) 277-9586
5/1	Marshall's R/C Raceway	PA	(717) 729-7458
5/1	PC Hobbies	NC	(919) 983-2514
5/1	The Track	MD	(301) 417-9630
5/2	City Speedway	CA	(619) 560-9633
5/2	East St. Raceway	PA	(412) 826-0602
5/2	Hobbyworld Raceway	CT	(203) 793-1111
5/2	Riders Superspeedway	MI	(313) 451-5599
5/2	West St. Hobbies	MA	(508) 533-1231
5/2	K/N R/C Speedway	CT	(203) 684-9896
5/2	Machesney Park	IL	(815) 282-1311
5/8	PC Hobbies	NC	(919) 983-2514
5/8	Skaneateles Raceway	NY	(315) 685-8077
5/9	Riders Superspeedway	MI	(313) 451-5599
5/9	K/N R/C Speedway	CT	(203) 684-9896
5/14	Marshall's R/C Raceway	PA	(717) 729-7458
5/15	East St. Raceway	PA	(412) 826-0602
5/15	The Track	MD	(301) 417-9630
5/15	JT Superspeedway	MI	(616) 965-0571
5/15	Skaneateles Raceway	NY	(315) 685-8077
5/16	Ameri-Trac	IL	(217) 234-8707
5/16	Autograph Raceworld	IN	(317) 778-3386
5/16	D&S Hobbies	OH	(216) 354-2112
5/16	Hobbyworld Raceway	CT	(203) 793-1111
5/16	Riders Superspeedway	MI	(313) 451-5599
5/16	West St. Hobbies	MA	(508) 533-1231
5/16	K/N R/C Speedway	CT	(203) 684-9896
5/22	JJT Superspeedway	MI	(616) 965-0571
5/23	City Speedway	CA	(619) 560-9633
5/23	Riders Superspeedway	MI	(313) 451-5599
5/23	K/N R/C Speedway	CT	(203) 684-9896
5/23	A&S Race Center	NY	(315) 598-2772
5/23	Machesney Park	IL	(815) 282-1311
5/28	Marshall's R/C Raceway	PA	(717) 729-7458
5/29	Niagra R/C Speedway	ONT	(416) 892-5548
5/30	Ameri-Trac	IL	(217) 234-8707
5/30	D&S Hobbies	OH	(216) 354-2112
5/30	East St. Raceway	PA	(412) 826-0602
5/30	Hobbyworld Raceway	CT	(203) 793-1111
5/30	West St. Hobbies	MA	(508) 533-1231
5/30	A&S Race Center	NY	(315) 598-2772

PROCAR World Series Nationals

DATE	TRACK	STATE	PHONE	PURSE
6/11-13	K/N R/C Speedway	CT	(203) 684-9896	\$4,125
7/3-5	Ameri-Trac	IL	(217) 234-8707	\$4,125
9/1-3	Lake Whipoorwill	FL	(407) 277-9586	\$4,125

PROCAR World Series World Championships

DATE	TRACK	STATE	PHONE	PURSE
10/7-10	PC Hobbies	NC	(919) 983-2514	\$12,950

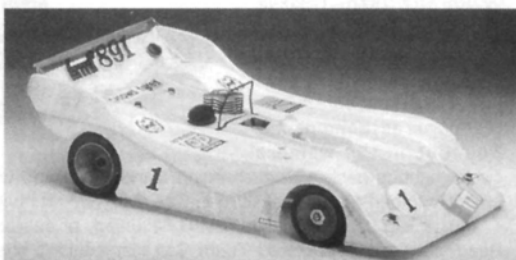


GASTRITIS

Take out your bottles of Pepto, because it's time for your next **gas attack**. This time, it's coming to you from that wonderfully **hip**, yet subtly boring Southern California town known as Hemet. Yes, the **intense racing action** was provided by a ton of well-known electric racers such as Cliff Lett, Jack Johnson, Kris Moore, Brian Kinwald, Jay Halsey, J.D. Beckwith, Mark Pavidis, Derek Furutani, Ron Rosetti and Rick Hohwart—just to name a few. There was also a slew of outside racers, such as the top Mugen and Kyosho **Japanese** and **Hong Kong** racers, and Jamie Booth and Mike Craddock from the **U.K.**

And, with all the top-name drivers at the race, two relatively **unknown racers caused an uproar**. One was **Doug Von Mosch**, who took a box-stock Kyosho Inferno to **top-qualifying honors**. His TQ run was an impressive feat, especially when you consider that it was Doug's first-ever 1/8-scale race.

The other racer who took everyone by surprise was **Chris McElroy**. He clinched the **A-Main overall win**, fending off the likes of Brian Kinwald, J.D. Beckwith, Yuichi Kanai and Jamie Booth. Keep your eyes open for an in-depth feature on the Kyosho Gas Challenge in the next issue.



IFMAR 1/8-SCALE WORLD CHAMPIONSHIPS TO BE HELD IN SWEDEN

The best of the best will converge on **Göteborg, Sweden, August 5th through the 15th** to determine the **1993 1/8-Scale Gas On-Road World Champion**.

The race will be held at the **VÄST-8** track in **Torslanda, Göteborg**. (Just as a side note, Torslanda is really near a Volvo factory, no kidding!). The host hotel is the **Hotell Europa**, and special race rates will be in effect.

Look for teams from **Picco, BMT** (the current World Champion), **Parsec** and **Serpent**—just to name a few—to be out in force.

If you want more information, contact president Lennart Idengren, PI 2795, S-430 41 Kullavik, Sweden. Telephone: +46 31 370475 or fax +46 31 932322.

Gil Losi Speaks

The Florida Winterchamps always attracts the "who's who" in R/C racing. All the top drivers and leading manufacturers attend what many refer to as most popular U.S. off-road race.

Car Action caught up with Gil Losi Sr. of Team Losi to chat about the state of the R/C "union." Here's how it went.

What's the best thing about races like the Winterchamps?

Naturally, you want to win these races, and you want the team to do well. But even if you don't win, as long as something positive happens, it's a good thing. Maybe a new part or modification works well, or perhaps one of our new drivers does really well—Mike Fletcher, in the Stock Class, for example. We're also here to help the racers. Our drivers are our ambassadors. They represent our company, so it's important for them to relate well with the public.

How important is it for you to win?

If we didn't want to win every race, we wouldn't be here. You need to win enough to show the consumer that the product works. You want the club racers to believe that they can improve their performance by buying our products. There are differences in product, but there are only a few drivers out there who could win with any car they drive. It makes a difference to me who wins, but what's really important is what happens at the club level and how our products are perceived.

How do you feel about "team" racing? Do you think that the classes should be separated?

I feel there should be a manufacturers' class. If we want to beat heads with other companies, we should, but let's give the privateers a break, and not involve them in our war. Factory drivers have special parts that the others don't. If the classes aren't separated, I think that these parts should be available to everyone in order to be legal. People may wonder about tires. How can you check to see if someone isn't using a new compound that's not yet available? Well, maybe the answer is to mark the tire molds for each compound so they can be easily identified.

Do you think that there is any room for relative beginners at races like the Winterchamps?

I wish there was. Right now, the race is limited to 400 entrants—a lot of whom have worked hard to get here. We need beginners, but I don't think that races like the Winterchamps are for beginners any more than I think that races like the Indianapolis 500 are for newly licensed drivers.

Sometimes, people come to an event like this, and they aren't prepared for this level of competition. They can be intimidated and overwhelmed and get turned off of racing.

What's your view of sanctioning bodies? Do you think that they address the needs of today's racers?

Sometimes, I think that the decisions are made to benefit a few, rather than considering the entire membership. We have to get to the point where we make choices that benefit everyone.

If you could change one thing about today's racing, what would it be?

Outlaw everything but Team Losi products! (laughs) Seriously!! I wish there was more Italian food at the tracks. I wish friendships were more important than company allegiances. Racing used to be more fun; we all shared parts and information.

It's not like that anymore since [the '89 IFMAR World Championships in] Australia.

How do you feel about all of the "I hafta be sponsored or I can't race" people?

People used to get discounts in my hobby shop if they helped to run races, worked on the track, etc. That was our team. If they were fast racers, good—but it wasn't necessary. When we became a manufacturer, we got the best drivers we could, but this was for R&D as well as for racing.

Let's just say this: sponsored drivers get stuff for free, and they don't support their local shops or tracks. Some deserve sponsorship, and some don't, but we have to figure out what's best in the long run—what's going to keep our sport flourishing.



POINT BLANK RACE SERIES



Following the lines of the popular Speedworks Sportsman Cup Series, Trinity proudly announces a series of **Point Blank** races. The races—1/10-scale on-road and 1/10-scale pavement/carpet racing—will be held in the Northeast. These handout-motor races will feature a special **"Masters Class"** for drivers over 40, using a handout stock motor and a single Sanyo SCRC 1700mAh battery pack. By providing the motors and batteries, Trinity hopes to **bring back racers** who left the hobby because of the ongoing battery and motor wars.

Along with the "Masters" class, there will be the usual handout stock motor class—using Point Blank stock motors—and a modified class. As of now, there are four races scheduled to be run from **mid-summer** through the end of the year. So, when the Point Blank tour comes to your town, check it out!

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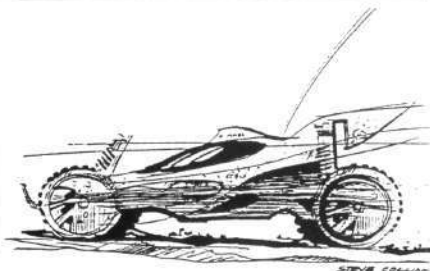
(Continued from page 60)

Are you still feeling reluctant to try these changes? It might seem to be a lot to learn, but to tune your truck's suspension for the best performance, you should really understand what—and why—you're changing. Make as many of these adjustments as you can, and note their effects. Your truck will soon handle

better than the others at your track, and you'll be the one to beat. You'll be the one everyone asks for set-up tips.

*Here's the address of the company mentioned in this article:

RPM, 14978 Sierra Bonita Lane, Chino, CA 91710.



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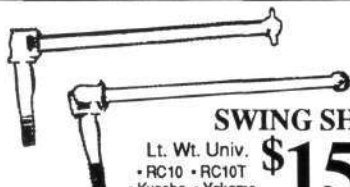


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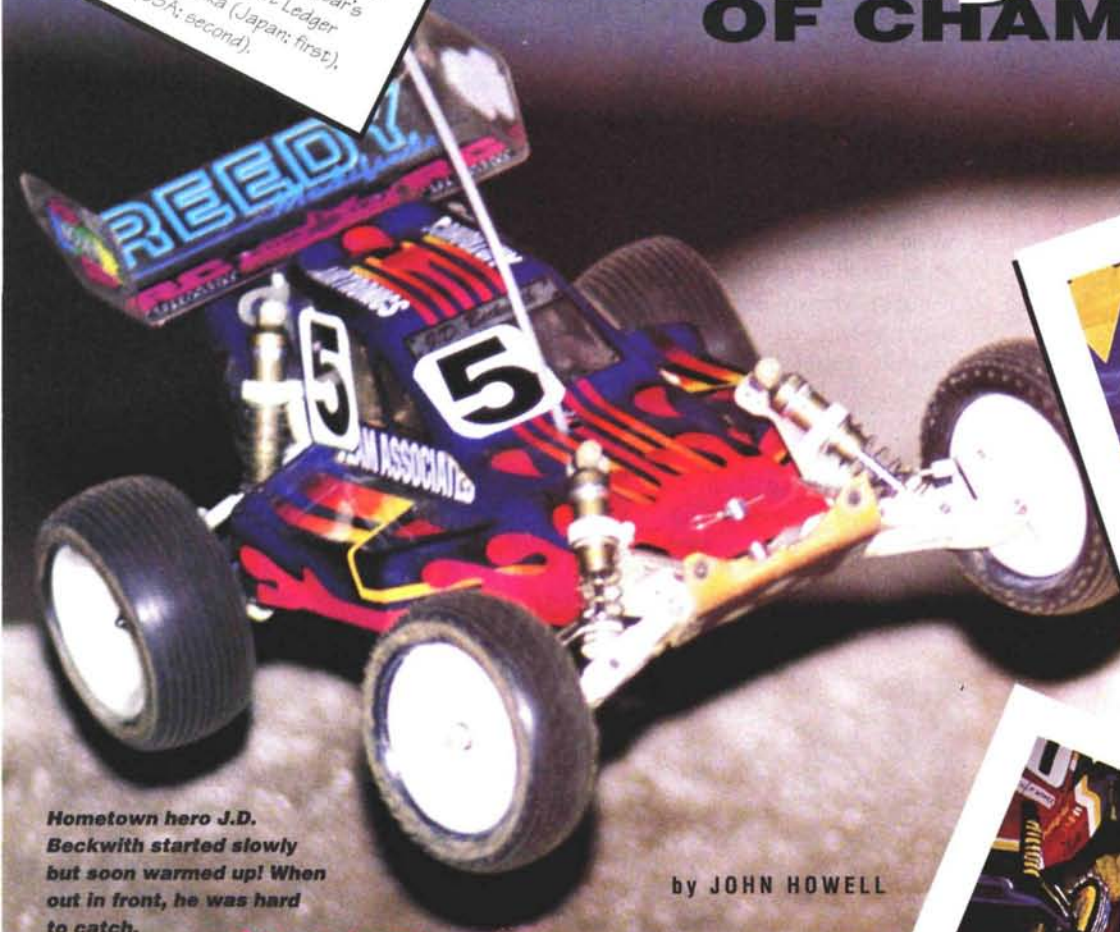


Radio Control
CAR ACTION
7th Annual

Reedy Race OF CHAMPIONS



The top three Invitational drivers at this year's Reedy Race. From left to right: Matt Ledger (USA; first), Masami Hirose (Japan; second), and J.D. Beckwith (USA; third).



Hometown hero J.D. Beckwith started slowly but soon warmed up! When out in front, he was hard to catch.

by JOHN HOWELL

AS THE R/C Car Action jet sped down the runway during our takeoff for California and the seventh annual Reedy Race of Champions, I couldn't help but wonder what lay ahead of me. I've always heard that, next to the IFMAR Worlds, this race provides some of the best

off-road racing, so I was psyched to be going!

This year's race was held near San Francisco at the Hobby Haven track in Livermore, CA, and it featured 30 of the world's top drivers. They came from Europe, Asia and Australia to compete against U.S. drivers in what has become known as the "Birthday Bash."



Associated's Scott Hughes is the first ever to win both the 2WD and 4WD overall in the Open Class. Next year, he'll be invited to race in the Invitational Class.



During the race, the top drivers signed the mural that covers the back wall at the Hobby Haven track.

BIRTHDAY BASH!



We had a surprise visit from Scheherazade the belly dancer and her apprentice genie, Ahmed Bababooie. Barbara Eden take note!

Birthday Belly Dancers

After Saturday's 2WD races, I was hanging out, waiting for the big Team Associated barbecue, when Gene Hustling whispered, "There's a big surprise planned for Mike. Bring your camera." I was prepared to take a few of those "cake-smashed-in-the-face"-type shots, but, with the sound of castanets, a blur of gold and green headed toward a stunned Mike Reedy. In the middle of the track, in front of a crowd of racers, Mike was given his *second* treat of the day—belly dancers! And, after his initial embarrassment, he joined the dancing—suitably attired in an improvised turban, of course! Gene and I promised to swap pictures. Maybe we'll use one as a *Car Action* cover...maybe not...!

Invitational Class Final Standings

Fin	Name	2WD	4WD	Motor	ESC	Radio
1	Masami Hirosaka	Associated	Yokomo	Reedy	Novak	KO
2	JD Beckwith	Associated	Yokomo	Reedy	Novak	Airtronics
3	Matt Ledger	Associated	Kyosho	Reedy	Novak	KO
4	Brian Kinwald	Associated	Yokomo	Reedy	Novak	Airtronics
5	Brent Wallace	Associated	Schumacher	Reedy	Novak	Futuba
6	Kevin Moore	Schumacher	Schumacher	LRP	LRP	KO
7	Mark Francis	Associated	Yokomo	Reedy	Novak	Airtronics
8	Mark Pavidis	Associated	Yokomo	Reedy	Novak	Airtronics
9	Scott Roberts	Associated	Yokomo	Peak	Novak	Airtronics
10	Cliff Lett	Associated	Yokomo	Reedy	Novak	Airtronics

Right: a Radio Shack R/C car was sacrificed at the end of the festivities between the tabletop jumps. A few racers attempted to clear the tabletop, but some found their cars heading straight into the flames.



Left: Jay Halsey turned heads whenever he hit the track. His full-throttle driving style gave the crowd many chances to see his insane passing maneuvers.



THE ROUTE TO REEDY

For those of you who don't know too much about the history of the race, I'll fill in a few details.

During the past seven years, all the world's top racers have gathered to race on Mike Reedy's birthday. Strange coincidence, perhaps? Wrong! Eight years ago, someone asked Mike Reedy what his best birthday present would be, and he replied, "To have all the best racers in the world race one another, just for me." And every year since then, on Mike's birthday, the R/C world has seen some spectacular racing.

The race consists of two classes: an Invitational (pro

drivers only) and an Open Class. Open Class drivers can compete in the 4WD Open and the 2WD Open classes, but the Invitational drivers must run 2WD and 4WD cars for six rounds each. At the end, a driver can "throw out" his worst time from both classes. A DNS (did not start), however, can't be thrown out, and it's equal to 8 points (the highest number of points possible), so you're bummin' if that happens, because the driver with the fewest points at the end of the race wins.

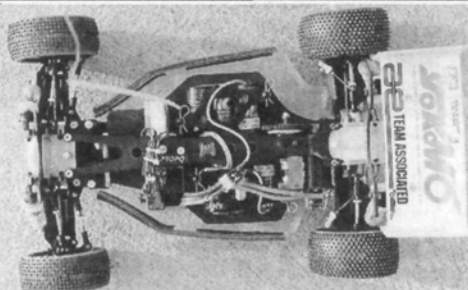
The 2WDs run on the first day, and the 4WDs wrap

Here's Jay Halsey with his new pit groupie who heads that hot, new magazine R/C Infant Action.

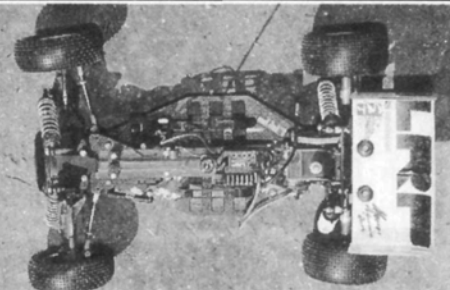


Two-wheel-drive mania! The two huge tabletops were too far apart to clear, but during one heat race, Masami cranked it up and tried. He was close, but not close enough.

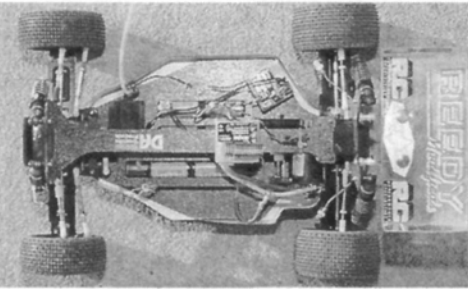
1 MASAMI HIROSAKA



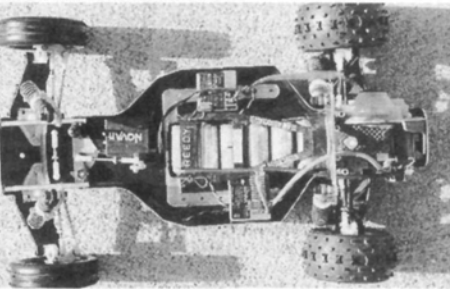
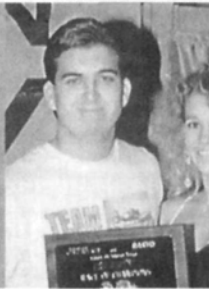
6 KEVIN MOORE



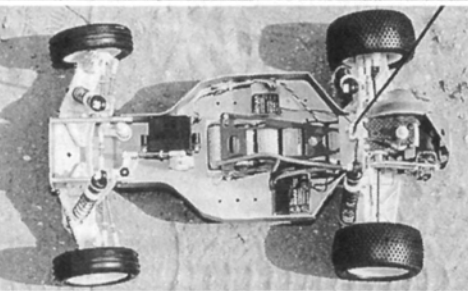
2 JD BECKWITH



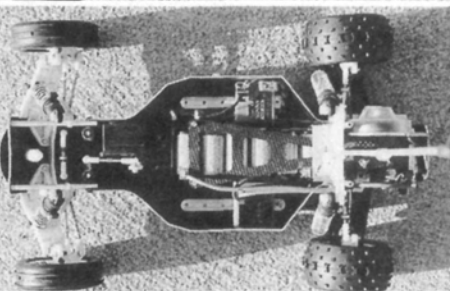
7 MARK FRANCIS



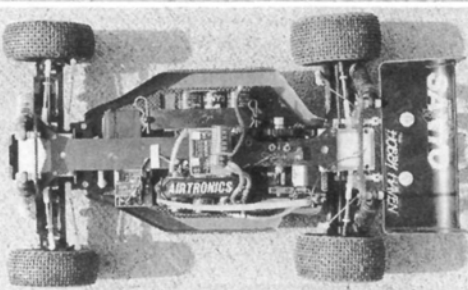
3 MATT LEDGER



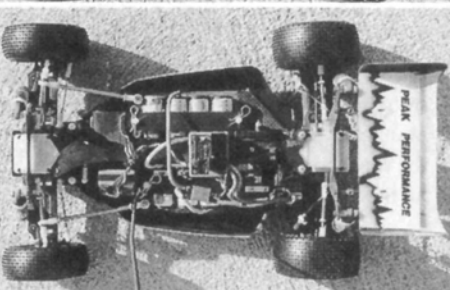
8 MARK PAVIDIS



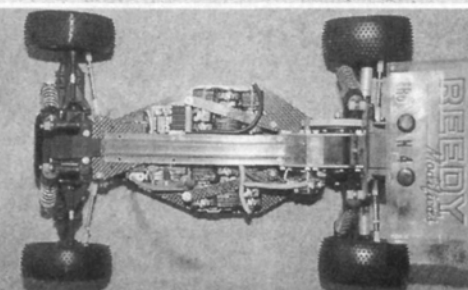
4 BRIAN KINWALD



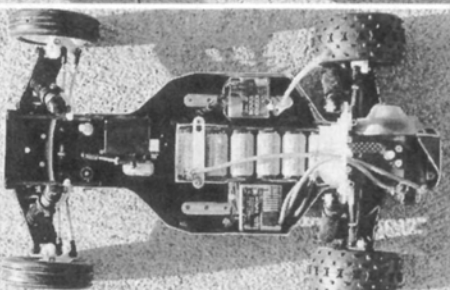
9 SCOTT ROBERTS



5 BRENT WALLACE



10 CLIFF LETT



TOP TEN INVITATIONAL CLASS WINNERS

Batteries

Yokomo

Reedy

Reedy

Reedy

Reedy

LRP

Reedy

Reedy

Team Orion

Reedy

Tires

Losi

Losi

Kyosho

Losi/Kyosho

Pro-Line

Losi/Kyosho

Losi/Pro-Line

Losi/Kyosho

Kyosho

Pro-Line

Sponsors

Yokomo, Associated, Reedy, Novak, KO

Associated, Reedy, Novak, Airtronics, RCRC, Yokomo, Pro-Line, Mugen, Com-Tru

Associated, Reedy, Novak, RCPS, Team Turbo, Pro-Line

Associated, Reedy, Yokomo, Novak, Airtronics, RCPS, MIP, Kimbrough, HPI

Associated, Schumacher, Pro-Line, Reedy, Novak, RCPS, Futaba, MIP, Zero'n'4 Hobbies

Schumacher, LRP, KO, Moore's Performance House

Associated, Reedy, Novak, Lunsford, Yokomo, RCPS

Associated, Yokomo, Reedy, Airtronics, Novak, RCPS, Kimbrough, Oakley, Dirt Squirt

Peak Performance, Associated, Orion, Novak, MIP, RCPS, Kimbrough, Lunsford

Associated, Reedy, Novak Pro-Line, Oakley, Airtronics, RCPS, Kimbrough

REEDY RACE OF CHAMPIONS

Reedy Race of Champions Invitational Results

FIN	NAME	COUNTRY	2WD	SUBTOTAL	4WD	COMBINED TOTAL
1	Masami Hirosaka	Japan	1.....3.....2.....2.....1.....5	9	1.....1.....3.....6.....2.....1	17
2	JD Beckwith	USA	5.....1.....1.....5.....1.....3	11	6.....2.....2.....3.....1.....2	21
3	Matt Ledger	USA	2.....1.....4.....4.....3.....1	11	4.....1.....8.....2.....2.....1	21
4	Brian Kinwald	USA	3.....7.....1.....1.....3.....1	17	4.....1.....1.....3.....1.....2	25
5	Brent Wallace	USA	1.....4.....7.....2.....8.....5	19	2.....6.....1.....1.....1.....1	25
6	Kevin Moore	England	3.....4.....1.....3.....2.....4	13	1.....4.....2.....3.....3.....4	26
7	Mark Francis	USA	4.....2.....8.....8.....1.....2	17	1.....4.....1.....2.....3.....5	28
8	Mark Pavidis	USA	4.....1.....5.....6.....2.....2	14	1.....2.....1.....7.....5.....5	28
9	Scott Roberts	USA	2.....4.....3.....2.....6.....6	17	2.....2.....5.....4.....2.....2	29
10	Cliff Lett	USA	2.....4.....3.....2.....6.....6	17	4.....6.....5.....1.....5.....3	29
11	Matt Francis	USA	3.....2.....2.....3.....6.....1	11	6.....8.....2.....4.....6.....1	30
12	Satoshi Maezumi	Japan	6.....2.....2.....4.....2.....4	14	5.....2.....6.....1.....8.....5	33
13	Satoshi Kayano	Japan	5.....1.....3.....5.....4.....4	17	7.....3.....4.....5.....1.....5	35
14	Craig Drescher	England	2.....5.....7.....1.....6.....1	15	8.....8.....3.....2.....3.....4	35
15	Jack Johnson	USA	4.....3.....5.....1.....4.....3	15	2.....5.....7.....4.....8.....3	36
16	Scott Anfinson	USA	7.....3.....3.....2.....2.....1	11	7.....6.....6.....6.....7.....4	40
17	Derek Furutani	USA	5.....2.....7.....7.....6.....4	24	3.....7.....4.....1.....2.....6	40
18	Rick Hohwart	USA	1.....6.....2.....4.....7.....2	15	8.....1.....7.....5.....6.....8	42
19	Rory Cull	England	6.....7.....5.....6.....3.....8	27	4.....6.....3.....2.....4.....3	43
20	Jay Halsey	USA	3.....6.....3.....4.....3.....6	19	2.....5.....6.....8.....4.....7	43
21	Daren Westman	USA	1.....3.....8.....7.....7.....8	26	5.....4.....5.....3.....5.....2	45
22	Reece Birtles	Australia	6.....5.....6.....6.....4.....7	27	6.....3.....4.....4.....4.....6	48
23	Bryan Peterson	USA	8.....4.....4.....1.....3.....3	15	7.....5.....8.....7.....7.....7	48
24	Jamie Booth	England	5.....6.....6.....7.....5.....5	27	3.....5.....3.....8.....3.....8	49
25	Jurgen Lautenbach	Germany	8.....7.....4.....3.....5.....3	22	6.....7.....4.....7.....4.....7	50
26	Hiroshi Suzuki	Japan	7.....5.....4.....8.....5.....7	28	3.....3.....5.....5.....6.....7	50
27	Kris Moore	USA	8.....8.....7.....3.....7.....7	32	5.....4.....2.....6.....5.....3	51
28	Jonathon Morgan	USA	4.....5.....6.....6.....7.....6	27	3.....8.....6.....7.....6.....6	56
29	Gil Losi Jr.	USA	6.....6.....6.....5.....4.....6	27	7.....3.....7.....6.....7.....6	56
30	Marc Neale	England	7.....7.....5.....7.....8.....5	31	5.....7.....7.....5.....7.....4	59

Bold numbers indicate throw-outs

up the next day's racing. Forty-eight heats are run to determine an overall 2WD/4WD winner, so the races are always fast, furious and run in quick succession with little waiting time between them. I don't have the space to give you a blow-by-blow account of the action, so I'll just hit the highlights.

INVITATIONAL 2WD

Before the first 2WD round, there was a noticeable "buzz" in the pits. Bench racing was at an all-time high and speculations, rumors and predictions were thrown wildly about.

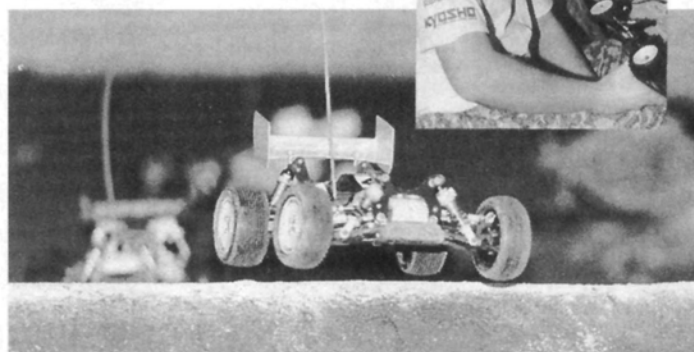
4WD Open Class

Fin	Name	Chassis	Motor	ESC	Batteries
1	Scott Hughes	Yokomo	Reedy	Novak	Sanyo
2	Aaron Biner	Yokomo	Reedy	Novak	Sanyo
3	Chris Walrod	Kyosho	Peak	Tekin	Sanyo
4	Greg Dennett	Schumacher	Extreme	Tekin	Sanyo
5	James Brown	Kyosho	Peak	Novak	Sanyo
6	Jeff Wittman	Schumacher	Reedy	Tekin	Sanyo
7	Eric Dennett	Schumacher	Extreme	Tekin	Sanyo
8	Robert Gillespie	Schumacher	Reedy	Novak	Sanyo
9	BJ Christensen	MIP/Associated	Reedy	Novak	Sanyo
10	Chris White	Traxxas	Peak	Novak	Sanyo

2WD Open Class

Fin	Name	Chassis	Motor	ESC	Batteries
1	Scott Hughes	Associated	Reedy	Novak	Sanyo
2	Jason Rudee	Associated	n/a	Novak	Sanyo
3	Jason Ronas	Associated	Redline	Novak	Sanyo
4	Brett Reelfs	Associated	Reedy	Novak	Sanyo
5	James Brown	Associated	Peak	Tekin	Sanyo
6	Andy Halio	Associated	Reedy	Novak	Sanyo
7	Quincy Hughes	Associated	Litespeed	Novak	Sanyo
8	Greg Hodap	Associated	Reedy	Novak	Sanyo
9	BJ Christensen	Associated	Reedy	Novak	Sanyo
10	Greg Dennett	Associated	Extreme	Tekin	Sanyo

There was talk about this being Team Associated's J.D. Beckwith's home track, and many asked whether this would give him a distinct advantage. What about Rick Hohwart—the defending champ? Did he have what it would take to cinch it again this year?



Top: smiling Jamie Booth came from England to race his Kyosho Triumph and Lazer. ■ **Above:** Masami cranks his 4WD car over the start/finish-line jump. He ran fast, but he couldn't beat Brent Wallace for the 4WD overall win. But second was good enough to take the combined win, and that's exactly what he was gunning for!

With their RC10s, Masami Hirosaka and Team Yokomo looked strong in practice. There were rumors that Masami would go all-out to win overall in 2WD because of his disappointing showing in that class last year. Scott Roberts and Brent Wallace—last year's Open Class winners—looked strong, but no one would ever discount the likes of Brian Kinwald, Cliff Lett, Jack Johnson, Mark Pavidis, Matt and Mark Francis, and...well you get the idea. They're all good.

By the end of the first round, I had definitely concluded that these

(Continued on page 161)

CALL TO ACTION

YOUR VOICE IS NEEDED

At the recent IMS hobby trade show, the Academy of Model Aeronautics and representatives of major radio manufacturers discussed a matter of urgent interest to all R/C hobbyists: a "Notice of Proposed Rule Making" (NPRM). The NPRM, published by the FCC, threatens—if approved—to jeopardize the use of half of our R/C ground frequencies.

The AMA, in cooperation with the R/C Manufacturers Association and a host of industry representatives, put together a program to meet the initial deadline for responding to the NPRM. The primary weapon in this struggle is a grassroots mailing campaign from modelers.

The giant electronics/communications companies that are looking for new frequencies obviously have substantial clout. An overwhelming avalanche of letters from modelers to Congress and to the FCC can also exert tremendous influence. If you have not already written such a letter, please do so now! Let your voice be heard before the next phase in the FCC's decision process has been completed. Below is an excerpt of the AMA notice to modelers.

URGENT FREQUENCY ALERT!

To all users of model frequencies in both the 72 and 75MHz bands: The FCC has issued a "Notice of Proposed Rule Making" (NPRM—PR Docket 92-235), which, if implemented, will have a profound effect on model frequency use. Developed by the FCC Land Mobile Service, it creates a massive frequency restructuring—the first of its type in 60 years.

The 419-page document addresses frequency use in another service (Part 88), but it will also affect Part 95 where our R/C frequency use lives. Without becoming too technical, the restructuring inserts two new frequencies between those presently assigned for modeling use and commercial users. That means we could have a transmitter almost four times the power output of ours only 2.5kHz away from a large number of our 72 and 75MHz frequencies. In the 75MHz band, half of our frequencies would be bracketed. An example of the frequency placing would look like this:

Model channel 62	75.430MHz
New insert	75.4325MHz
New insert	75.4375MHz
Present commercial	75.440MHz
New insert	75.4425MHz
New insert	75.4475MHz
Model channel 63	75.450MHz

Not only are these new frequencies very close to ours, but they're also designated as "mobile," so we'll never know where they're operating. In addition, the technical specifications for the new equipment allow a legal frequency tolerance that could place their signal directly on ours!

The AMA, with full industry support, will pursue all avenues available through the legal counsel they retain to represent modelers before the FCC. The first step in that process is the filing of formal comments. Other steps will follow. You and your club members can help us make our point! You're being asked to write now to the agencies in the federal government that represent you!

SEND YOUR LETTERS TO:

- FCC, 1919 M St. NW, Washington, D.C. 20554.
- Your senator: the Honorable [name], U.S. Senate, Washington, D.C. 20510.
- Your representative: the Honorable [name], U.S. House of Representatives, Washington, D.C. 20515. (For the name of your senator or representative, contact the Capitol switchboard at (202) 224-3121.)

In writing your letters, it is important to do the following:

1. Include the identification of the proposed rule making: PR Docket 92-235.
2. Personalize your concerns: e.g., "I'm an active competitor in local, national and international events," or "As a student, I learn valuable lessons from building and operating models," or "I'm active in our local club."
3. Indicate your financial involvement: "I own pieces of radio equipment that would be unusable if this frequency assignment is adopted."
4. Strongly stress the safety and liability aspect created by the proposal! "Our club operates at a public park," or "Since the proposed new frequencies are so close, interference will occur and render most model frequencies unusable."

The best approach is a letter written by you to the government officials involved.

The second level of effectiveness is a signed form letter. The least effective communication is a petition simply signed by individuals. (This approach isn't recommended.)

Many people—not just those who actually build and operate models—derive enjoyment from our hobby. Ask them to write and indicate their concern!

The most important thing to remember is act now!

For additional information, contact the Technical Department at AMA Headquarters—(703) 435-0750, ext. 264.

ADVERTISEMENT

TEAM LOSI

TECH TALK

MORE STEERING!

Many racers ask us, "How do we get more steering?" The truth is that there are several ways. The following are just a few methods.

USE THE CORRECT SERVO-SAVER

When drivers complain about not having enough steering in their 1/10-scale off-road cars and trucks, they're probably using the wrong servo-saver. If you use a Kimbrough servo-saver that mounts directly on the servo, it must be the large one. If you use the small, 1/12-scale servo-saver, this will cause most of your steering loss. The spring in this servo-saver isn't strong enough. Always use the larger ones on off-road vehicles.

STEERING ENHANCEMENT KIT

An easy way to get more steering in the Pro-SE is to use the Jammin' Steering Enhancement Kit (part no. J-550). This kit changes the geometry of the Pro-SE's front end, increases its steering and makes it slightly more stable. All of our team drivers use this kit, and they're pleased with its performance.

TUNE YOUR TIRES

Another simple way to get more steering is to trim your front tires. If you trim the outside rib off the front tires, you'll notice that you'll have more steering going into the corners. On truck tires, if still more steering is needed, trim both inside and outside ribs.

Be sure to experiment with trimming before you try it at a race; sometimes, it can make the steering feel "twitchy." Trimming ribs for use on very hard-packed, dry tracks may result in a slight loss of steering.

* * *

Let us know what's going on! Address your questions and problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710.

CLEVELAND

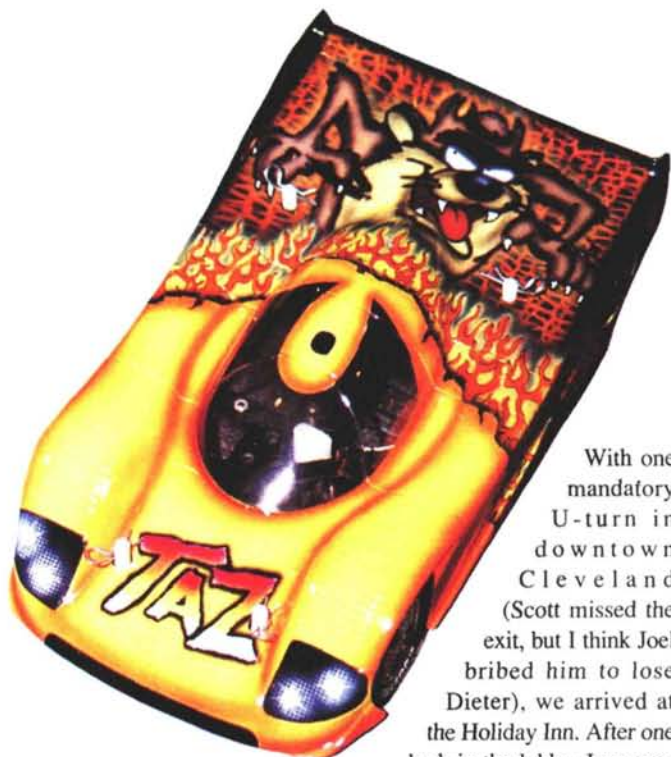
Indoor CHAMPS

THE U.S. INDOOR Championships in Cleveland, OH, held every year over the Thanksgiving weekend, is considered by many to be the most prestigious race in 1/12 scale. The annual trek to Cleveland is always a ball. This year, I made the trip with East Coast Modified driver Scott Williams, and we tossed Joel Johnson in the back of the car as well. In the van behind us was Trinity's "Ace Mechanic," Jim Dieter, with his motor man, "Dr. Armature" Neal McCurdy. Tony Neisinger was wrapped in blankets somewhere in the back of the van. (He hates this cold stuff.)

by
JOHN THAWLEY

Furious Four-Cell Mania





This radical Tasmanian paint job took top honors in the Best Paint division.

With one mandatory U-turn in downtown Cleveland (Scott missed the exit, but I think Joel bribed him to lose Dieter), we arrived at the Holiday Inn. After one look in the lobby, I remembered how much fun this was. Everyone was fighting for luggage carts, giving the receptionist a hard time, trying to get rooms next to their friends, or simply trying to get a room. It's exciting, and it's a blast.

If you've never attended the Indoor Champs, you need to know one thing: forget about getting a good night's sleep. It doesn't exist. The party goes on just about all night. There might be two or three hours of downtime, but that's about it. People practice until two in the

CLEVELAND INDOOR CHAMPS



Chris Doseck and his newest prize—the Cleveland Indoor Champs A-Main 1st-place trophy.



Todd Lewis poses for the cameras with his Stock Class TQ trophy and his A-Main 1st-place trophy.



'93 Cleveland Concours winner

morning and work on their cars all night. If you run Modified, you might as well adjust your clock to Pacific time, because you'll be on the evening shift. Stock starts around 8 a.m. and Modified starts around 4 p.m. Either way, your body is abused.

Typically, I like to give you round-by-round details of qualifying, but the Cleveland race doesn't

STOCK A-MAIN

Fin	Qual	Name	Chassis	Motor	Batteries	Tires	Radio	ESC	Body
1	1	Todd Lewis	Losi 12G	T	Max-Cell	TRC	JR R-756	Tekin 411G	Associated Nissan
2	4	Aaron Buran	CompCraft 12L	E H	Power Push	Paragon	Futaba Magnum	Novak M5	Bud's Nismo
3	2	Brett Polivka	Corally SP12G	A A	Perfect Match	Yokomo	Airtronics Caliber	Tekin 411G	Bud's Nismo
4	8	Dave Reiman	Associated 12LW	M N	Stage III	TM	KO EX-1	Tekin 411G	Associated Nissan
5	5	Everett Pietras	Corally SP12G	D	New Wave	Corally	JR R-756	Tekin 411P	Associated Nissan
6	7	James Arnold	Corally SP12G	C O	Team Smooth	TRC	KO EX-1	Tekin 411G	Bolink Chevy
7	9	Greg Klugh	Corally SP12G	L U	Stage III	HPI/PSE	Airtronics Caliber	Tekin 410K	BBR Lotec
8	10	David Chester	Associated 12LW	A T	Max-Cell	Associated	Airtronics Caliber	Novak M1c	BBR Lotec
9	6	Brad Hughes	Corally SP12G	S	Major Woody	Corally	Futaba PCM	Tekin 411P	Bud's Nismo
10	3	Chris Mockerman	Associated 12LW	S	Power Push	TRC	Airtronics Caliber	Novak M5	Associated Nissan

MODIFIED A-MAIN

Fin	Qual	Name	Chassis	Motor	Batteries	Tires	Radio	ESC	Body
1	5	Chris Doseck	Corally SP12G	CAM	Arlington	TRC	KO EX-10	Tekin 411G	Associated Nissan
2	2	Mike Blackstock	Associated 12LW	Reedy	Max-Cell	TRC	KO EX-1	Tekin 411G	Associated Nissan
3	1	Joel Johnson	Trinity EV12	Trinity	Trinity	TRC	Airtronics Caliber	Novak HPC	Andy's Mercedes
4	3	Steve Radecky	Associated 12LW	Bud's	Power Push	TRC	JR R-756	Novak HPC	Bud's Nissan
5	7	John Orr	Associated 12L	Twister	Arlington	Corally	KO EX-1	Novak HPC	Associated Nissan
6	4	Mike Lafaso	Associated 12LW	Reedy	Perfect Match	Yokomo	Airtronics Caliber	Novak HPC	Associated Nissan
7	6	Bill Jeric	Associated 12LW	Bud's	Power Push	TRC	KO Propo	Novak HPC	Bud's Nismo
8	10	Eric Whitlock	Corally SP12G	Twister	Team Smooth	TRC	Futaba PCM	Novak HPC	Bolink
9	8	Bud Bartos	Associated 12LW	Bud's	Power Push	TRC	KO Propo	Novak HPC	Bud's Nismo
10	9	Jeff O'Malley	CompCraft 12L	Bud's	Power Push	Du-Mor	JR R-756	Novak HPC	Bud's Nismo



A fan gets some invaluable Chris Doseck ink on the back of his shirt.

lend itself to that style of reporting. The qualifying days are so long (would you believe 2:00 a.m.?!) that it's impossible to watch it all. Yes, I admit it; I wasn't in the ballroom all the time—but please don't tell the Ayatollah.

In the early going of Stock qualifying, Everett Pietras, Brett Polivka, and Aaron Buran let everyone know that they had come to race. Pietras led the pack with a 34/8:14.55 run. Unfortunately for Everett, by the end of qualifying on Saturday, Todd Lewis had knocked 7 seconds off that time. Todd found himself sitting on the pole with a 34/8:07.93. Sitting on the outside was Brett Polivka with a 34/8:09.80.

Sponsors

Team Losi, Max-Cell, JR Propo, Team Class
Bud's, Power Push, Team Class, Finie Line Designs, TAC Racing
Perfect Match, Team Class, CAM, Sheldon's, Bud's, Boca, Traxxas
Stage III, TM R/C, Riders Hobby, TAC Racing
Team Class, New Wave Cells
Du-Mor, Tekin, Team Smooth, S&S, DuraTrax, Arlington Hobbies
Team Class, Tekin, Stage III, Racer's Choice, BBR, HPI, PSE
Major Woody, JB Hobby, Team Zoom, Little Racers

Sponsors

CAM, Arlington, Tekin, KO Propo, TRC
Assoc., Reedy, Tekin, Max-Cell, Paragon, TRC, Comp. Elec., Bud's
Trinity, TRC, Novak, Magic Motorsports, Cellular One
Bud's, Power Push, Novak, Assoc., TRC, Du-Mor, JR, M.E. Paint
Twister, Associated, Novak, Team Arlington, Du-Mor
Assoc., Reedy, Perfect Match, Novak, Bud's, Victor, Airtronics
Bud's, Novak, Power push, TRC, KO Propo, Great Planes
Twister, Team Smooth, Bud's, Bolink
Bud's, Power Push, Novak, Deb & Scott Law, Linda & Vicki Carruba
Bud's, Power Push, JR, Composite Craft, American Modeler

The qualifying in Modified was intense. Round one saw a changing of the guard. Suddenly, there were names—although prominent—that weren't familiar to the top 10 in Cleveland. It was obvious that this would not be a typical U.S. Indoor Championships. (Then again, is there ever one?) Point Blank's Neisinger and Doseck (for CAM) finished the first round about one second apart. Twister's John Orr was sitting in 3rd and Buddy Bartos of Bud's Racing was in 4th.

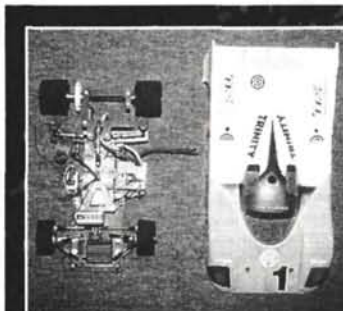
Neisinger's performance with Trinity's prototype was impressive. Although he turned a 35/8:01.59, Tony admitted that he

Tony's charm lasted only one round, though. In round two, Joel Johnson decimated the field with a blistering 36/8:05.06. Doseck and Reedy's Mike Blackstock were a half lap back with 36/8:10.36 and 36/8:11.49 respectively. Bill Jeric, driving for Bud's Racing, picked up the 4th spot with 36/8:11.65.

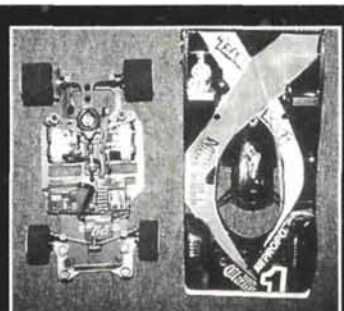
The only significant change in round three was that Blackstock nudged Doseck out of the number-two spot and Eric Whitrock picked up his first appearance on a Cleveland top-10 list. (Eric was sitting in 9th for Twister.)

In round four it was Johnson and Blackstock. Joel took the pole

"The qualifying in Modified was intense. Round one saw a changing of the guard. Suddenly, there were names—although prominent—that weren't familiar to the top 10 in Cleveland. It was obvious that this would not be a typical U.S. Indoor Championships."



Joel Johnson's top-qualifying prototype Evolution 12.



Here's Todd Lewis's TQ and Stock A-main winning car.

wasn't comfortable with the car after his final round of practice. Nevertheless, he was committed to the long-term effort required to develop a new race car, and he decided to stick with it. Tony told me (this is a direct quote, and it's probably why he's a world champion), "I'm not satisfied with the car, but I don't care, I'm going to go out and TQ with it!" Well, he did!

with a 36/8:02.63. Blackstock charged and finished with a 36/8:05.60. Two very impressive runs were turned in by Steve Radecky for Bud's and Mike Lufaso for Associated. Both had 36/8:09s.

The Mains were run on Sunday, and excitement filled the hotel. While everyone picked their favorites, the place was abuzz with talk of the spectacular racing and of all the new names in this year's A-Main.

Another topic of conversation



Mike Blackstock poses with his car and his 2nd-place trophy.

EDITORIAL OPPORTUNITY

Air Age

Air Age, Inc., publisher of *Radio Control Car Action* and other hobby-related publications, is looking for a creative, motivated individual who is

interested in a magazine career. You'll work on *Radio Control Car Action* and related special publications and books. You must have good writing skills and some knowledge of the R/C car hobby. Experience with photography and magazine publishing are a plus. This is a great career opportunity with a fast-growing company. Send your résumé to:

Frank Masi
Executive Editor
R/C Car Action
251 Danbury Road
Wilton, CT 06897

CLEVELAND INDOOR CHAMPS

"Congratulations to NORCAR club members and the new U.S. Indoor Champions, Todd Lewis and Chris Doseck."

was Associated's off-road driver, Brian Kinwald, and his impressive straightaway launch, complete with fireworks, that took out the scoring monitor. Those wild off-road drivers! You see what happens when you let a buggy guy in a carpet race? They should lock him up! Crashing into the monitor like that! That's not right!

As usual, the stock A-Main was a

for everyone but Doseck. When the horn sounded, the pack was off. Johnson barely got through the first turn, and the pack was jamming up. As they went from the second right turn into the first left, everyone saw what was about to happen. At the second left, the freight train caught up, and a chain reaction was beginning. Joel's car was tagged on the left side and it tumbled over the boards. He was in bad shape with nowhere to go. Recognizing that he had to let cars that were behind him pass (the rule for jumping a board), he tried to let them all by at once. This didn't work well for Joel or the pack. Cars were flying everywhere. It actually took about two or three laps for the race to settle down. By this time, Doseck had gone.

As the race progressed, a battle started to shape up. Blackstock, Johnson and Radecky had managed to survive. Joel had worked his way back up to challenge Chris, but he bobbled, and Radecky got by. Radecky was breaking deep into

the corners, and he held Joel off for a while. Blackstock had worked his way through and was also becoming a factor. The three-way battle for 2nd was the break that Doseck needed. Blackstock got by on the last corner to take 2nd place. Joel had just enough power left after his comeback from 9th to hang on for 3rd. Radecky finished 4th. Second, 3rd and 4th places were separated by 87/100 second. This Main rocked the joint!

All in all, the weekend was what the U.S. Indoor Champs is all about—new technology, great racing, old friends and lots of fun. Once again, the NORCAR club put on a great show. Congratulations to NORCAR club members and the new U.S. Indoor Champions, Todd Lewis and Chris Doseck. ■



Here's the Trinity gang. From left to right: Jim Dieter (designer of the Evolution 12), Joel Johnson and owner Ernie Provetti.

great race. Though they battled hard, Lewis was not to be denied. Buran and Polivka went at each other tooth and nail, while Todd drove away. When the dust had cleared (OK, OK, I know it was carpet—it's an expression!), Todd Lewis was the man! Todd pulled off with a 35/8:10.39 and the U.S. Indoor Championship Stock crown. It was a superb drive.

The last three Modified mains were all excellent. Josh Cyrul, driving for TAC Racing and Stage III, showed brilliant driving strategy as he patiently waited out Trinity's Dan Louis. His patience paid off, and Josh took the top spot in the C-Main.

In the B-Main, it was all Tony Neisinger, with a very impressive win. Way to go, Tony!

The A-Main was a head-banger

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Seth's Speedways, 3400 Hiland Dr., Anchorage, AK 99504; Seth Graham, (907) 337-3777

Southtown Hobby & Raceway, 12001 Industry Way #2, Anchorage, AK 99515; Bob or Vickie Peters, (907) 345-3131

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Outlaw Raceway, 5309 Lakewood Rd., Ft. Mohave, AZ 86427; Frank Greely, (602) 768-5001

R/C Raceplex, 5222 W. Glendale Ave., Glendale, AZ 85301; Bill Murray, (602) 934-5567

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Race Prep Raceway, 852 S. Hwy. 89, Chino Valley, AZ 86323; Mike Dunn, (602) 636-1955

Scale Racing Sports, 1120 N. Hayden Rd., Tempe, AZ 85281; Mike, (602) 829-9117

Sierra Vista Raceway, 105 N. Central Ave., Sierra Vista, AZ 85635; Wayne Tuthill Sr., (602) 459-1335

Speedway Hobbies, 1000 N. Humphreys St., #204, Flagstaff, AZ 86001; Gary McAllister, (602) 556-0710

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AERCC, Vimy Ridge Rd., Little Rock, AR, (501) 945-7037

Arkansas Int'l. Superspeedway, P.O. Box 1636, Pine Bluff, AR 71613; Joe Pitts, (501) 247-2371

DCA Racing, 412 Hiway & 14th St., Paragould, AR 72450; Lyle Spillman, (501) 236-9706

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Brake-a-Way Raceway, 3179 Hamner Ave., Norco, CA 91760; Debbie Burnie, (714) 736-6063

California Auto Racers (CAR), 96 San Tomas Aquino Rd., Campbell, CA 95008; Club Line, (415) 508-9971

Cats West Raceway, 5631 Old Lonetree Way, Antioch, CA 94509; Jerry Winkelbaver, (510) 779-0505

City Speedway, 7750 Convoy Ct., San Diego, CA 92111; (619) 560-9633

Cloverdale R/C Raceway, 1 Citrus Fair Dr., Cloverdale, CA 95425; Tom Kelley, (707) 586-9789

Covina Racing Company, 1611 W. San Bernardino Rd., Covina, CA 91722; Tom, (818) 331-4984

Cycle Art Raceway, 2211 N. Pleasant Way, Fresno, CA 93705; Richard De Benedictis, (209) 233-3665

D&D Raceway, 290 S. First St., Turlock, CA 95380; Dave Miller, (209) 667-0970

Desert R/C Raceway, 9231 E. Hobson Way, Blythe, CA 92225; Rodney Lazenby, (619) 922-5516

Desert R/C Raceway, 39360 3rd St. E., Ste. 305, Palmdale, CA 93550; (805) 272-1835

Drag City, 1361 W. Valley Blvd., Colton, CA 92324; Chris Gabriel, (714) 370-0580

Fast Eddie's R/C Raceway, 3261 Edward Ave., Santa Clara, CA 95054; Eddie Allague, (408) 986-8256

Fast Lane, 25845 San Fernando Rd., #21, Saugus, CA 91350; (805) 255-2404

The Finest R/C Off-Road Circuit, 8711 Elder Creek Rd., Sacramento, CA 95820; Jason, (916) 381-6555

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Greater Los Angeles R/C Racing Club, California State University, Parking Lot A, Los Angeles, CA 90045; Glenn Williams, (213) 734-7888 or Tom Wong, (310) 821-5472

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Hobbycrafters Raceway, 323 Five Cities Dr., Pismo Beach, CA 93449; (805) 773-6765

Hobby Haven Raceway, 3983 First St., Livermore, CA 94550; Tom Welding Jr., (510) 443-5828

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Jackman's R/C Raceway, 1616 N. Beale Rd., Marysville, CA 95901; Bonnie or Harry Jackman, (916) 741-3744

K&M R/C Raceway, 22474 A Barton Rd., Grand Terrace, CA 92324; Mike Blake, (714) 783-0899

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M'n'M Hobbies, 710 E. Parkridge, Corona, CA 91719; Don Hughes, (714) 272-3545

Merced R/C Auto Racers (MRCAR), 1652 W. North Bearcreek Dr., Merced, CA 95348; Ed Lopez, (209) 725-8040

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Paso Robles R/C, P.O. Box 3795 (3980 Linne Rd.), Paso Robles, CA 93447; (805) 237-0624

Perris Recreation R/C Track, 120 N. Perris Blvd., Perris, CA 92370; Len or Fay Shirley, (714) 943-6603 or 657-4879

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R/C Racing Center, 9842 Channel Rd., Lakeside, CA 92040; Russ or Cindy, (619) 443-2270

R/C Sports, 759 E. Monte Vista Ave., Vacaville, CA 95688; (707) 446-5555

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Barry's R/C Raceway, 2701 SW College Rd., #603, Ocala, FL 32674, Barry Lewis, (904) 231-4403

Brantford R/C Raceway, Rt. 3, Box 240, Brantford, FL 32008 (904) 935-0758

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5-Hilly S Raceway, County Rd. 555, Bartow, FL 33830, Chuck Noke, (813) 321-7406

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Paul's R/C Track & Hobby, 4511 Dr. M.L. King Blvd., Suite B, Tampa, FL 33614, Paul or Eula Schmitt, (813) 872-8662

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TJ's R/C Raceway & Hobby Shop, 1019 Swington Rd., Pensacola, FL 32504, John Jaffe, (904) 479-2331

West Coast R/C Club, Lake Park, 17211 N. Lake Mary, Tampa, FL 33549, Tom D. Daffin, (813) 969-1683, evenings (813) 239-9627

Wilbur Avenue Raceway, 1949 Wilbur Ave., Fort Beach, FL 32606, (407) 967-1230

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ARCAR Raceway, 6894 B. Peach Hwy., Dunwoody, GA 30342, Greg Owen, (404) 445-4533

Carnesville R/C Raceway, Rt. 2, Box 2343, Carnesville, GA 30521, Bruce, Mackenzie or Penny Sartin, (404) 484-4800 or 454-4567

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Georgia Hobby Center, 112 Kincaid Rd., Fayetteville, GA 30214 (404) 460-1752

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Victory Speedway, 5416 Anna St., Boise, ID 83705, Bruce Walker, (208) 353-0114

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AJ's Raceway, Kessinger Road, Country Club, 46015, Alton, IL 61815, (618) 242-7172

Ameri-Trac, Rt. 2, Box 242, Matteson, IL 61558 (217) 234-8707

Badlands II, 320 W. Jackson St., Urbana, IL 62401, (618) 783-2913

BARR, 839 River Dr., Byron, IL 61010, Tim Parnes, (815) 734-5675

C&R Hobbies, 39 E. Jones, Milledge, IL 61953, Ray, Crutcher, (618) 889-4973

Centennial Park LeMond Dirt Burners, 7821 Bremer Dr., Downers Grove, IL 60516, Scott McQuinn, (708) 968-6411

Central Illinois R/C Car Club, contact Ron Barr, 104 Old Lee N. Park, IL 61854 (309) 382-2597 or Randy Houser, 570 S. 10th, Pekin, IL 61654 (309) 347-4912

Central R/C Raceway, Rt. 2, Box 51-A, Carleton, IL 62626, Tim Stewart, (217) 854-9118 or Don Rice, (217) 854-9785

Diehard R/C Raceway, 300 N. Main, Kewanee, IL 61443, Dick Jennings, (800) 852-3700

Eagle Speedway, 303 N. Plain, Plainfield, IL 61754, Joe or Vickie Bachman, (815) 841-1738

Hobby Raceway, 5327 4th Ave., Mahan, IL 61265, Tony, (309) 755-5534

Hobby Town Raceway, 4611 W. Rt. 124, DuQuoin, IL 62855, Mike Dehler, (618) 875-3147

JC Hobbies/Metro Motor Speedway, Metropolis Airport, Metropolis, IL 62960 (618) 524-9919

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M&E Hobbies & Raceways, 400 N.
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Mark Kays (708) 556-3224

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Macchesney Park, IL 61111 (815) 282-
1411

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Magnum R/C Speedway, RR #2, Box
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MARYLAND

Mercer Co. R/C Off-Road, RR 3, Box
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Midwest Hobby Trax, 114 Kuhlman Dr.
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Patterson (708) 378-
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MISSOURI

Monroe R/C Raceway, 26049
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R/C

The R/C Track, 15022 S. Artesian
Highway, IL 60426, Edmund Johnson
(708) 331-4159

R/C

Radio Active Raceways, 151 N.
Pulaski, IL 61801, (217) 501-5557

R/C

Redline Raceway, 921 Harding
Columbia City, IL 60409 (708) 862-
8191

R/C

Rick's R/C Raceway, 122 W. 12th St.
Stratford, IL 61364, Rick Wallace (815)
675-1870

R/C

Rockford Scale Raceway, 6900 N. 2nd
St., Macchesney Park, IL 61111 (815)
765-2978

R/C

SIRCAR Raceway, 1201 N. Main
Cambridge, IL 61801 (618) 549-5885

R/C

Slot Wing Hobbies Race Place, 1615
N. Springfield, Champaign, IL 61821
(217) 358-1929

R/C

Smithton Community Park, P.O. Box
9152, Oakville, IL 62221 (618) 236-
7564

R/C

Superior Raceway, 1706 W. Bradley
Champaign, IL 61821 (217) 359-8273

R/C

Thunder Road Speedway, Intersect on
of Bradley and Division, Coal City, IL
60418 (815) 674-8053

R/C

Valley Farms R/C Raceway, 706
Bypass 20, Cherry Valley, IL 61016
(815) 332-4516

INDIANA

Autograph/Race World, 231 Pendleton
Ave., Paintsville, IN 46064, Sam Muhl
(317) 778-3386

R/C

B.J.'s Riverside Raceway, 265 S. Clay
St., Jasper, IN 47546, Joe Loney (812)
482-3484

R/C

Blaze'n Race'n, P.O. Box 6, Hamlet, IN
46532, James Berrett (219) 867-1324

R/C

Boone County Raceway, 1300 E. 100
S. Rd., Lebanon, IN 46052, Jerry Moss
or Alan Lippert (317) 482-4827

R/C

CC Hobby & Speedway, RR 1, Box 68,
Francesville, IN 47946 (219) 567-2447

R/C

Classic Hobbies, 420 E. Commercial
Tipton, IN 46356, David Schreffler
(219) 698-0649

R/C

County Line R/C, 2333 W. State Rd.
38, Sheridan, IN 46069, Greg Welch
(317) 758-6393

R/C

Hobby Barn Raceway, 1950 Springhill
Terre Haute, IN 47802, 9694 (812)
289-5173

R/C

Hobby Masters, 8501 Bash
Indianapolis, IN 46250, Jim Price
(317) 575-1961

R/C

The Hobby Prescription, 115 S.
Indiana Ave., Auburn, IN 46706
Roxanne Fox (219) 926-6699

R/C

Hobby World Raceway & Hobbies,
1508 N. Harlan, Evansville, IN 47111
Jeff Wassman (812) 421-1100

R/C

K&L Hobbies & Raceway, 3275 North
525W, LaPorte, IN 46350, (219) 324-
3353

R/C

Main Hobbies, 625 Columbia
Lafayette, IL 47901, Randy Palmer
(317) 42-2045

R/C

Mooreville R/C Hobby, 7 Moore St.
Mooreville, IN 46158 (317) 831-8877

R/C

Mooreville R/C Hobby, 9201 S. State
Rd. 67, Canby, IN 46113 (317) 831-
8877

R/C

P&T Hobbies and Raceway, RR 2
Highway 601, Mitchell, IN 47446, Paul
Webster, Tom Logsdon (812) 649-6666
fax (812) 332-0018

R/C

R/C Barn, 310 N. 125 W., Monroe, IN
46712, Mark Emmerich (219) 692-
6890

R/C

R/C World of Indiana, RR #2, Box 335
Lynn, IN 47355 (317) 874-2464

R/C

R/C Zone & Raceway, 6380 W. 34th
St., Indianapolis, IN 46224, Russ or
Grey (317) 290-0067

R/C

Race St. Raceway & Hobby, 1126 1/2
Race St., New Castle, IN 47367, John
or Nancy Strong (317) 521-4888

R/C

Raceway Park, 919 E. McKinley
Mishawaka, IN 46545, Ron Bean (219)
258-1020

R/C

Radio Car Craft, 1925 S. Curry Pike
Bloomington, IN 47402 (812) 332-
3245

R/C

The Rink, 7900 Whitcomb, Merrillville
IN 46410, Don Reimer (219) 769-8113

INDIANA

Runway Hobbies Raceway, 5342
Elmwood St., Indianapolis, IN
46203, Randy Hult (317) 764-2421

R/C

TQ Hobbies & Raceway, 13710
Wacker Ave., N. 41, Cedar Lake, IN
46303, Jack Wilson (219) 374-9776

R/C

Winner's Circle Speedway, State
Road 10 and 55, Rossmore, IN 46310
Harold Holmes (219) 987-4106

R/C

IOWA

Barney Raceway, RR 1, Box 243,
Plainfield, IA 50666, Fred Good (319)
276-4825

R/C

Dubuque R/C Speedway, Dubuque
County Fairgrounds, Dubuque, IA
52001, Pat Connor (319) 556-2735

R/C

Kodiak Race Track, Box 76, Okoboji
IA 51555, Bird or Dave (712) 332-
7982

R/C

M&M RaceTrack, 2444 Perry Path
Oskawville, IA 52577 (515) 673-6265

R/C

Marble's Hobby Supply, 4685 SE
42nd St., Des Moines, IA 50320, Rick
Marble (515) 262-7507

R/C

Mr. Car Raceway, Central Iowa
Fairgrounds, Marshalltown, IA 50158
(515) 483-2234

R/C

North Park R/C Speedway, 605 S.
Jerome, Algona, IA 50511 (515) 285-
9352

R/C

Plymouth County R/C Speedway, 4th
Ave., ME, Plymouth, County
Fairgrounds, Efforts, IA 51031 (712)
546-8788 or 546-9522

R/C

Power House Racing, 1200 S. Division
St., Creston, IA 50801 (515) 782-4582
or 782-4174

R/C

River City R/C Speedway, 610 2nd
L.W. Mason City, IA 50401, Leonard
Johnson (515) 423-7333

R/C

Rotunda Raceway, 101 Bays, RR 1,
Box 155A, Storm Lake, IA 50596
(712) 732-4555

R/C

Sibley Raceway, Osceola County
Fairgrounds, Sibley, IA 51345, A. Beck
(712) 764-2604 (days) or 764-3613
nights

R/C

Southwest Iowa R/C Raceway, Kells
Park, Red Oak, IA 51566 (712) 623-
5513

R/C

Southwest Iowa R/C Raceway,
Montgomery County Fairgrounds, Red
Oak, IA 51566 (712) 623-5513

R/C

Spenser R/C Raceway, 419 Grand
Ave., Spenser, IA 51301, Steve or
Mike (712) 262-0633 or 7864

R/C

Team Johnson Speedway, 1st Hwy
34 & 406 West Burlington, IA 52605
(319) 753-0753

R/C

KANSAS

ACE Raceway, 325 Commercial
Emporia, KS 66801, Luke Amend
(316) 343-1933

R/C

Chad's R/C World & Raceway, 217
Browne Ave., P.O. Box 76, Scammon
KS 66537 (913) 793-2313

R/C

Ebersole R/C Superspeedway, 11417
W. Hwy 54, Wichita, KS 67209, Ler
Ebersole (316) 727-8888

R/C

**Pittsburg International Mini
Speedway**, 5111 2nd St., Leosist
Pittsburg, KS 66062 (316) 232-1971

R/C

R/C Superdome & TO Pro Shop, 14 E.
Ave., Hutchinson, KS 67501 (316)
665-6633

R/C

R/C World & Raceway, 217 Broad
Ave., Sallisaw, KS 66537, Greg Green,
(913) 493-2313

R/C

R&R R/C Raceway, 900 N. Santa Fe
Salina, KS 67401 (913) 823-7062

R/C

RRC Raceway, 507 N. 4th, Abbeot
KS 67233, Bob Doherty (913) 626-
1261

R/C

Shawnee Hobby & R/C Raceway, 4603
Shawnee Dr., Kansas City, KS 66106
Bill Pugh (913) 384-3211

R/C

The Speed Zone, 12809 Plumtree
Olathe, KS 66062, Brian Bowman (913)
829-5787

R/C

KENTUCKY

A&J Raceway, RR 64, Box 322, A. Lyle
KY 40340, A. Smith (606) 523-9710

R/C

Bluegrass Int'l/Perry's R/C Hobbies,
214 Noble St., Radcliff, KY 40360
William Perry (502) 351-RACE

R/C

East Kentucky Hobby Raceway, Hwy
15, Garner, KY 40324 (606) 653-
8567

R/C

Fast Lane Hobbies & Raceway, 281
Parker Pike, Bowling Green, KY 42301
Greg Bailey (502) 782-2419

R/C

Hobby Center Inc., 2186 Triplet St.
Owensboro, KY 42303, Brian Hower
(502) 583-7611

R/C

Hobbys Plus, 319 Main St., Hazard, KY
41701, Joe Mazurek (606) 436-3755

R/C

The Lexington Autodrome Raceway,
2753 Richmond Rd., Lexington, KY
40509 (606) 269-7794

R/C

Lexington Model Shop Raceway, 211
N. Circle Rd., Lexington, KY 40505
Bill, Don (606) 293-2951

R/C

Pro-Trak R/C Racing, 3481 Gene Run
Rd., Louisville, KY 40011, Les Walzel
(502) 239-4307

R/C

Remote-Control Hobby Shop,
Raceway, RR 8, Box 211, Mayfield,
KY 40066 (502) 747-4115

R/C

River Cities Raceworld, 1104 Power
Ln., Elizabethtown, KY 41039 (606) 836-
CARS

R/C

Tn-City R/C Raceway, 2490 Ruggle St.
Ashland, KY 41001, Eddie Williams
(606) 324-6305

R/C

West Kentucky R/C Cars, 45 Hawkins
Loop, Simpson, KY 42082 (502) 851-
3534

R/C

LOUISIANA

Acadiana R/C Hobbies & Raceway,
129 Triplet St., Lafayette, LA 70506
(514) 282-5825

R/C

Baha Raceways, 22211 Hwy. A,
Hattiesburg, LA 39123, Bruce or Don
Rodriguez (504) 235-4988

R/C

Cajon R/C Raceway, RR 2, Box 286
Houma, LA 70333, Beckett or Jim
(705) 252-8126, (705) 252-3855

R/C

Cajon R/C Raceway, 110 A Dardennes
Sulphur, LA 70683, (504) 311-
Ridehouse (318) 527-9729

R/C

Johnny V's R/C Hobby & Raceway,
1116 W. Ann Marie Hwy., Lake Charles, LA
70608, Johnny or Victor or Sharon Adams
(504) 681-9045

R

Track Directory

40 Speedway, 933 Palaski Hwy.,
Hillside, IL 60178 MD 21078 Doug
Lynch (312) 411-1100 Chicago (410) 439-
3999

Freemship Off-Road Racers, 1531
Pine Ridge, Severn, MD 21144 (301)
361-3999

Fruitland Indoor Race Center, 205 N.
E. and Rte. 42, Hants, MD 21826
Thomas Duncan (410) 545-4329

Maryland R/C Track, 4201 G B Road
Seabrook, MD 20725 James Holes
(410) 422-6125

Radio Control Cars Inc., 13600 A
Arlington, Bowie, MD 20715 Paul
Fuchs (301) 262-1444

Suzie Goose Hobbies, 718 E. Guide
Dr., Rockville, MD 20850 (301) 279-
2965

The Track, 16806 Oakmont Ave.,
Gaithersburg, MD 20877 Mimi Wong
(301) 417-9539

MASSACHUSETTS

Archer's Lane R/C Raceway, 118
Washington St., Rt. 1, S. Attleboro
MA 01930 (508) 399-6262

C&C Hobby & Raceway, 562 Russell
Mills Rd., S. Weymouth, MA 01978
(508) 991-4117

Centerline Hobbies, 167 Corporation
Rd., Haverhill, MA 02601 (508) 274-
2244

CKS Raceway, 46 W. Graham St.
Pawnee, MA 01869 (413) 283-2260

Julio's Hobby & Speedway, 825 Main
St., Rt. 109, Ypsilanti, MA 02054 (508)
376-1933

Megadrome Raceway/BRCR, N.
Adams Place, Rt. 8 North Adams, MA
01247 Gordon (413) 683-9593
Richard (413) 445-4717 Warren
(413) 442-2566

Mike's Speedway, Rt. 31 Mt. Vernon
Mills, Andover, MA 01835

Naylrix Raceway, Holmes Rd.
Pittsfield, MA 01201 Rick Welch or
Vale Zerkman (413) 443-2488 or
(413) 988-66

R/C Hobbies & Speedway, 1211
Purchase St., New Bedford, MA
02740 (508) 991-5040

R/C Hobbies & Speedway, 5628 Reed
Rd., N. Dartmouth, MA 02747 Rickie
Dove (508) 991-5040

R/C World Raceway, 100 Crawford
St., Leguminster, MA 01453 Dan (508)
537-9733

West St. Hobbies, 1140 Main St.
Methuen, MA 02843 (508) 533-1231

MICHIGAN

Baja Bayou Off-Road Raceway, 5313
W 22 Mile Rd., Tustin, MI 49688 Mike
Lambert (517) 829-3447

Can-Am Hobbies Speedway Park,
1152 Gribble, Marquette, MI 49804
Don Grunne (313) 364-3338

Central Michigan R/C Raceway, 1210
James Sargeant, Midland, MI 48640
Mark Siragusa (517) 631-1488

Cereal City R/C Off-Roaders, 2030 E.
Columbia Ave., Battle Creek, MI 49015
(616) 963-2506

Chatter Box Racing, P.O. Box 164 Old
State Rd., Central Lake, MI 49622 Bill
Aftergill (616) 544-9829

Dirt Slingers Raceway, 2460 S. M139
Benton Harbor, MI 49022 Tom
Edwards (616) 927-1437

DNH Raceways, 4630 Hill Rd., Harbor
Beach, MI 48441 Kacey (517) 479-
6093

Doug's Dirt Way, 5710 Colby Rd.
Dowagiac, MI 48861 Doug Conn (517)
723-3368

Elmer's R/C Speedway, 2683
Lakeshore Dr., Niles, MI 49120 Randy
or Kristi Easton (616) 683-7380

Farwell Park Raceway, 2781 E. Outer
Dr., Detroit, MI 48234 Eddie McCreary
(313) 963-0805

Fun Tyme High-Banked Oval, Fun
Time Adventure Park, 6295 E. Saginaw
Rd., Grand Lodge, MI 49831 (517)
655-5533

Harrison International Speedway,
3519 N. Clark Ave., Harrison, MI
48025 John Starkweather (517) 534-
2921

JJ's R/C Speedshop, 5645 E. 14 Mile
Rd., Warren, MI 48092 (313) 927-
5420

JT Superspeedway, 825 Graham Ave.
Belle Creek, MI 49017 Jeff or Dan
(616) 965-0371

Larry's Performance R/C's, 4130
Highland Rd., Waterford, MI 48328
Lynn, Russ (313) 683-5529

Ludington R/C Raceway, 1483 N.
Dennis Rd., Ludington, MI 49431
(616) 843-4654

Mason County R/C Car Track, West
Shore Community College, 1611 N.
Washington Ave., Ludington, MI
49431 Scottie, MI 49454 (616)
843-6553 or 843-4837

McRC Raceway, 4601 Page Ave.
Jackson, MI 49203 Sam Sprague (517)
787-9161

Mike's Raceway, 7 North St., Ypsilanti
MI 48197 Mike Hulse (313) 38-4308

NMRCC Raceway, 110 E. Outer
Bayview, MI 49735 Ed Schneider
(517) 732-3963

Pointe R/C, 2119 Summer Rd., Mt.
Pleasant, MI 48858 Frank (313) 473-
5117

R&L Hobbies, 9782 Portage Rd.
Kalamazoo, MI 49007 Rex Simpson
(616) 324-3686 or (616) 324-4744

R&S Hobbies & Raceway, 233 Mt. St.
St. Louis, MI 48801 Rich Brad or
Scott Davis (517) 691-3463

Rad & Bad Raceway, 810 S. Maize
Rd., Warsaw, MI 48624 Mick
Bushing (517) 425-4373

Radio Wave Hobbies, 14000 One 14
Mile Rd., Fremont, MI 48838 (616)
754-2170

Rider's Superspeedway, 42040
Knapprock, Ste. 400 Canton, MI
48107 Brent Marbo (313) 451-5599

Rider's Superspeedway, 4415 S.
Westledge, Kalamazoo, MI 49008 Ken
Penn (616) 349-2666

T/A Raceway, 119 S. Michigan, Big
Rapids, MI 49307 Harvey (616) 796-
3211

Thumb Raceway, 3441 S. Main St.
Marlette, MI 48453 (517) 635-7848

TNT R/C Raceway, 130 W. Washington
St., Marquette, MI 49855 Greider,
Berg, (906) 278-4098

USA Raceways, 6803 Oak Hw.,
Bridgman, MI 48722 (517) 777-7054

Village Hobbies-n-Crafts, 17824 N.
Maple Island, Hesperia, MI 49421 Alan
or Fran (516) 654-1374

MINNESOTA

ABC Raceway, 120 2nd St. NW
Fergus Falls, MN 56464 Ross Lange
(507) 825-5087

Season Sport & Hobby, 312 S. Blvd.
St. Cloud, MN 56301 Caesar Kaiser
(763) 381-6666

Dr. Skate's R/C Raceway, Heritage
Road, a 2nd Ave., MN 56401 Gary
Bennett (656) 388-8441

Greater Minnesota Racin' Place, 3302
Scandia Dr., St. Cloud, MN 56301
Ron Jackson (763) 752-9158

Mini-E-Golf & Hobby, 3100 Park Ave.
St. Paul, MN 55130 (612) 441-6365

The PBR Off-Road Rally, 721 Center
Ave., Hutchinson, MN 55342 Phil Zempke
(612) 848-2129

Range Racing World, Inc., 412 Jones
St., Eden Prairie, MN 55334 Bill (218) 744-
4423

Squid's R/C Autos, 924 Main Avenue
Moorhead, MN 56501 Jeff Greenlee
(218) 733-3554

Tracks Racing, 2700 Myrtle Ave.
St. Paul, MN 55114 Walter Orfelle
(612) 644-3474

Wild West R/C Speedway, 2822
Edmund Ave., Duluth, MN 55811
Regis DeLuca (218) 424-6248

MISSISSIPPI

Crossroads Raceway, Mall of Commerce
Rt. 1, Box 1, Corinth, MS 38834 (601)
282-2193

Dixieland R/C Speedway, 2535
Lumberton Rd., Columbus, MS 39732
Jeffrey Akers (601) 328-9429

Fast Freddy's Raceway, 20390 Hwy.
48, Saucier, MS 39574 Mark Payne
(601) 833-0215

Joe McFadden Hobbies, 1619 51st
Ave., Meridian, MS 39307 Joe
McFadden (601) 482-7000

Norm's R/C Hobbies, 602 W. Old Pass
Rd., Long Beach, MS 39569 Norm
(601) 863-6524

Small Cars Unlimited, 820 Cooper
Rd., Jackson, MS 39212 (601) 372-
FAST

Up Front Racing, 549 N. St.
Savannah, MS 38701 Troy Borden
(601) 334-9411 or 378-9701

MISSOURI

All Seasons Hobby, 152 O. Lake
Plaza, 214166, MO 63366 Ben
Dames (314) 281-8767

Blue Speedway, 12719 E. 47th St.
Kansas City, MO 64133 Mark Ramioli
(816) 358-0238

Doug's Hobbies, 5221 West of Town,
Jefferson City, MO 65109 (314) 893-
5861

Fast Eddie's, 10 S. Coffman, Flat
River, MO 63691 Eddie Smith (314)
437-3393

Fast Trax Racing Assoc., 212 E.
Linnwood Springfield, MO 65807 Kim
Page (417) 831-5046

Gateway R/C Track & Hobbies, 255
Marshall Rd., P.O. Box 345, Valley
Park, MO 63088 (314) 225-5844

**Harrisonville Hobby Shop &
Raceway**, 2301 E. Commerce
Harrisonville, MO 64701 Richard
Taylor (816) 897-9655

Lafayette Riverside Raceway, Rt.
Box 9663, Marshall, MO 64701
(816) 337-0412 Dan Lammington (314) 966-
8912

**Owensville Raceway, Hobby Shop &
More**, 115 N. First St., Owensville, MO
65066 Mike Brune (314) 764-7461

Ozark Hobby, Rt. 6 Box 248 3 Ozark
MO 65751 Deborah Ackerson (417)
485-4552

Pevelly R/C Raceway, 2799 Cleburne
Barford, MO 63012 Jeff, Ben (314)
364-8657

R+ Hobby, 590 Langanham Rd., St.
Peters, MO 63376 (314) 928-9838

S&P Performance Shop, 5383
Highway 10, St. Charles, MO 63304
Paul Lued (314) 447-5262

Suppenbach Winter Racing, Route 5
Box 66, Pleasant Hill, MO 63080 Jim
Suppenbach (816) 587-5928

The Track, Rt. 8 Box 701, Pagers
Bluff, MO 63901 Scott (314) 785-
5237 or Bruce (314) 785-7400

MONTANA

Bozeman R/C Powerhouse Track,
2001 Gate of the Moon Mall, Bozeman
MT 59715 (406) 585-6161

Garden City Raceway, 11851 2 Ind.
93, Laramie, MT 59047 Dave Erickson
(406) 273-2730

Hobbytown Raceway, 1415, Lane
Bozeman, MT 59715 Tom Duncan
(406) 587-3512

Magic City R/C Raceway, 14th St. W.
& Central Ave., Billings, MT 59101
(406) 269-9034

Pockets Raceway, Montana State
Fairgrounds, Great Falls, MT 59405
Greg Vetter (406) 761-2719

Stormer Raceway, 23 High Speed
Road, Glasgow, MT 59230 Mike
Sterner (406) 278-4569

NEBRASKA

Hobby Town USA, 3494 W. 15th St.
Grand Island, NE 68801 Les Connors
(308) 782-3457

On-Road Raceway, Rt. 5, 4th St.
Omaha, NE 68114 Dave Hladky (402)
392-1176

Over the Wall Gang, Fremont
Speedway, 401 Market Pl., Norfolk, NE
68701 Matt Moeller (402) 379-0819

RACE Raceway, 10075 S. Re.
Mitchell, NE 68301 Randy
Schumacher (308) 624-1490

Riverside Raceway, Hwy. 27 South
Lincoln, NE 68505 Jeff Butler (402)
321-3379

The Salvation Army, 4032 Harrison
St., Omaha, NE 68147 (402) 31
Michael Palumbo (402) 634-3414

NEVADA

AMS R/C Raceway, 1137 E. Reno, S.
400, Sparks, NV 89411 (702) 355-
8899

Fastrax Raceway, 4078 W. Barent
Las Vegas, NV 89138 Larry or Stu
Anderson (702) 222-9300 or 666-2855

Little City Hobbies Raceway, 640
Sunset, Reno, NV 89503 Jay (702)
786-3611 or Bob Ayers (702) 358-
2629

Western R/C, 6104 Richmond Las
Vegas, NV 89139 Randall Grogan or
Mark Stucke (702) 891-2277

NEW HAMPSHIRE

4-K Racing, 101 Warren Rd.
Winchester, NH 03470 (603) 279-
6001

Hobby Etc., Heritage Place, Rt. 111A
Amherst, NH 03821 (603) 595-5529

Hooksett Hobby Raceway, 1328
Hooksett Rd., Hooksett, NH 03106
(603) 426-3426

NE Hobbies R/C Raceway, 19 Lake
Rt., Exeter, NH 03824 (603) 442-2774

R/C Racing Connection, P.O. Box 495
Amherst, NH 03821 Mike Bridges or
Burt Laster (603) 968-9663

Robert's Railroad & Hobbies, Box
401, Rt. 4 at Rt. 152, Montpelier, VT
05602 Robert Lister (802) 942-9793

NEW JERSEY

Action Raceway & Hobby Center, Rt.
295 & Hammer Rd., Gibbstown, NJ
08027 (609) 473-8933

AI & Rich's R/C Speedway, Rt. 5
Wendover, NJ 08093 (609) 584-7381

130 RADIO CONTROL CAR ACTION

Dave Bicknell Memorial Raceway,
P.O. Box 914, Absecon, NJ 08201; Rob
Caruso, (609) 748-8291

EMC Tracks & Trains, 1235 Rt. 23
South, Wayne, NJ 07470; (201) 628-
4838

Family Hobbies, Northwst &
Weymouth Rd., Vineland, NJ 08360;
Ziggy Tepper, (609) 794-8677

Glassboro's Grand Oval Speedway,
167 S. Delsea Dr., Glassboro, NJ
08028; (609) 863-1551

Golden Hobbies & Crafts, 415A Erial
Rd., Pine Hill, NJ 08021; (609) 782-
1222

Jackson R/C Racing, Marshall Ave.,
Jackson, NJ 08527; (908) 905-1593

LBRA Track, 392 Warburton Pl., Long
Branch, NJ 07740; (908) 222-5122

Parlor Hobbies, 34 Broad St.,
Mattawan, NJ 07747; Charlie Roder,
(908) 566-3158

Pit Stop Dragway, Campus Rd.,
Totowa, NJ 07512; Kimberly Frank,
(201) 942-5955

Pixley International Speedway, 763
Peters Dr., P.O. Box 189, Martinsville,
NJ 08836; Richard Toole, (908) 560-
0399

The Race Place, Rt. 33 & 34,
Farmingdale, NY 07727; (908) 938-
5215

Radical Raceway, 100 Rt. 17S, Lodi,
NJ 07727; Lou, (201) 843-6996

Ricky G's Raceway, 2208A Hamilton
Blvd., South Plainfield, NJ 07080;
(908) 753-1518

S&M Speedway, 4 Feild Rd.,
Bedminster, NJ 07921; Lee Spano,
(908) 234-2750

Spernell Speedway, 2301 Rte. 9
North, Great American Flea Market,
Hawell, NJ 07731; Mitch, (908) 577-
9191

Tri-Oval Speedway & R/C Center, 296
S. Main St., Phillipsburg, NJ 08865;
(908) 454-2223

Truck Challenge, 1162 Rt. 202-206 N.,
Bridgewater, NJ 08807; Michael Gill,
(908) 658-9616

Zeppelin Hobbies, 92 Rt. 23N,
Riverdale, NJ 07457; Lou Ballini, (201)
831-7717

NEW MEXICO

Cliff Hanger R/C Raceway I, 1515 E.
20th Space D, Farmington, NM 87401;
Butch or Joey, (505) 327-3187

Cliff Hanger R/C Raceway II, 2508 Fox
St., Farmington, NM 87401; Butch or
Joey, (505) 327-3187

The Pit, Las Cruces Hobby Raceway,
1996-A S. Valley Dr., Las Cruces, NM
88001; (505) 524-8530

Roswell R/C Raceway, 1004 N.
Greenwood, Roswell, NM 88201; Larry
Jumper, (505) 623-6693

TRC Race Park, 1303 E. 8th St., Truth
or Consequences, NM 87901; Gary
Whitehead, (505) 894-3211

NEW YORK

A&D's FastTracks, 1000 N. Main St.,
Brewster, NY 10509; (914) 279-2065

A&S Race Center & Hobbies, 120
Cayuga St., Canalview Mall, Fulton,
NY 13069; (315) 598-2772

Aldon Speedway, 100 Castle St.,
Geneva, NY 14456; (315) 789-8343

Brockport Speedway, 6000 Sweden
Walker Rd., Brockport, NY 14420; Gil
& Betty Glidden, (716) 637-6224

Brownie's Pro & Sport Hobbies, 124
Bennett St., Staten Island, NY 10302-
1426; John Brown, (718) 727-2194

Cars R/C & Guitars, 4360 Seneca St.,
West Seneca, NY 14224; (716) 674-
0905

Capital District R/C Racers, 27
Venus Dr., Albany, NY 12205; Keith
Green, (518) 783-7859

Catskill Regional R/C Raceway,
Glascio Turnpike, Mt. Marion, NY
12456; (914) 336-5951

Central New York R/C Auto Racers,
Martin St., P.O. Box 116, Rome, NY
13440; John Orr, (315) 336-5140

Chipmuck Hill R/C Speedway, 217
Pine St., Theresa, NY 13961; Ted
House, (315) 628-5065

Creekside R/C Raceway Park, 5242
Route 228, Trumansburg, NY 14886;
Lawrence C. Updike, (607) 387-5513
after 6 pm.

D&J's Speedway, 94 Maple St.,
Croton-on-Hudson, NY 10520; Dan
Spatta, (914) 271-5797

Daytona Miniature Raceway, 59
Lamar St., W. Babylon, NY 11704;
(516) 491-4041

Dirt Track, 17 Fairway Dr.,
Manorville, NY 11949; Billy
Wroblewski, (516) 878-0737

East End Off-Roaders, Route 25A at
Gull's Square, Wading River, NY
11792; (516) 929-8844

Gamien's R/C Motor Speedway,
8453 Rt. 11, P.O. Box 1430, Cicero,
NY 13039; Dave Wright, (315) 699-
2991

GP Racing, 6785 Martin St., Rome,
NY 13440; Greg Phillely, (315) 336-
5140

Island Hobbies & Raceway, 410
Commack Rd., Deer Park, NY 11729;
(516) 254-6229

HobbyTown USA, 629 Plank Rd.,
Clifton Park, NY 12065; Larry Burwell,
(518) 383-1215

Lakeside Raceway & Hobbies, 712
Willow Ave., Ithaca, NY 14850; (607)
272-0248

Latest Hobbies & Raceway, 781 Rt.
25A, Rocky Point, NY 11778; Joe
Jolin, (516) 929-8844, fax, (516)
929-5002

LI 1/4-Scale Racers, 63 Horton Dr.,
Huntington Station, NY 11746; (516)
351-5384

Maspeth Raceway, Rust St. & 57
Rd., Maspeth, NY 11378; Walter,
(718) 897-7921

PRO-LINE

Pro-Line Introduces New XTR Compound

Released four years ago, Pro-Line's original XT compound was developed as a lightweight, high-performance blend of natural rubber that would offer superior traction on a variety of track conditions. In addition, tires made of this compound lasted much longer than those made of conventional rubber compounds.

Pro-Line was one of the first tire manufacturers to design car and truck tire-tread patterns to suit specific track conditions: the Race Engineered Design (R.E.D.) Series.

Through a subtle reworking of its XT compound, Pro-Line has taken off-road tire technology to the next level of performance, and the result is the new XTR compound. This was developed to provide serious racers with a softer, more pliable tire that will have more "bite" on harder tracks.

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'92 ROAR Modified 2WD National Champion
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'92 NORRCA Modified 2WD National Champion
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'92 ROAR Region 12 Modified 2WD & 4WD Champion
'92 ROAR Region 11 Modified 2WD & 4WD Champion
'92 ROAR Region 10 Modified Truck, Stock Truck & 2WD Champion
'92 ROAR Region 4 Modified 2WD & 4WD Champion
'92 ROAR Region 3 Modified 2WD Champion
'92 Reedy Top Gun Modified 2WD, 4WD & Truck Champion



New XTR Part Numbers

8015	Pro-15 XTR Multi-Rib 2.1" Front 2WD
8022	Pro-22 XTR Coarse Spike 2.150" Rear 2WD or 4WD
8065	Pro-65 XTR Multi-Rib w/Staggered Mini-Bars 2.2" Truck Front
8080	Pro-80 XTR Original Mini-Pin Design 2.0" Rear 2WD or 4WD
8081	Pro-81 XTR Mini-Pin 2.150" Rear 2WD or 4WD
8082	Pro-82 XTR Fuzzie 2.150" Rear 2WD or 4WD
8090	Pro-90 XTR Original Mini Pin Design 2.2" Truck Rear
8092	Pro-92 XTR Fuzzie T 2.2" Truck Rear
8101	Pro-101 XTR World's Step-Spike 2.150" Rear 2WD or 4WD
8110	Pro-110 XTR Plus Step-Spike 2.150" Rear 2WD or 4WD
8120	Pro-120 XTR Coarse Spike 2.2" Truck Rear
8130	Pro-130 XTR Plus Step-Spike 2.2" Truck Rear
8150	Pro-150 XTR Step-Spike 2.2" Truck Rear

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Pro-Line USA, P.O. Box 456, Beaumont,
CA 92223; (714) 849-9781.

Track Directory

North Fork Pacesetters, Jimmy Jun's Hobby House, 7355 Main Rd. Mathtick, NY 11952, (516) 298-2020

Northwood Hobbies Raceway, 2-4 S. Main St., Northwood, NY 13668, Tom Jarrus, (315) 353-6621

Performance Hobbies Raceway, 205 North Ave., Webster, NY 14580, Anthony Genov, (716) 621-1274

Performance Plus R/C Speedway, The Hobby House, 11412 Jones & Gifford Ave. Jamestown, NY 14701, (716) 488-1772

Queens Off-Roaders, 42-12 13th St., Long Island City, NY 11101, (718) 392-5766

R/C Competition Corner, K-Mart Plaza, Muttville, NY 13211, (315) 455-8718

R/C Hobbies, Rt. 49, Box 136, Constantia, NY 13044, Roy Cathod, (315) 623-9336

R/C Speedway & Hobbies, 155 State St., Watertown, NY 13601, Steve Penn, (315) 788-1320

R/C World Hobby Center, 69-57 Juniper Blvd., Middle Village, NY 11379, (718) 326-0032

R/S Hobbies, 356 Macedonia Ct. Rd., Fairport, NY 14582, (716) 425-3722

Race O Rama, 44 Sharon Ave., Plattsburgh, NY 12901, James Varro, (518) 562-5442 or 643-2678

Rampage R/C, 53-57 Bradant Pl., Hyde Park, NY 12538, Brian Walker, (914) 229-2456

Ransomville, R/C Raceway, 2570 Academy St., Ransomville, NY 14131, Irene Press, (716) 791-8310

Rapid Transit Raceway, 2104 Broadway, Schenectady, NY 12305, Dick Cronise, (518) 372-0777

Riverside R/C & Hobby, P.O. Box 175, Rt. 126, Beaver Falls, NY 13305, (315) 346-1682

Rochester Raceway & Hobby, 1725 N. Clinton Ave., Rochester, NY 14621, George, (716) 467-2427

Rock River Model Hobbies, RD 2, Box 297, Rock River Rd., Jitter Creek, NY 14847, Carl Schmidt, (607) 532-9489

Russell's R/C Racecraft, 1793 Ridge Rd., Ontario, NY 14519, (315) 524-2522

Schenectady R/C Speedway, 955 State St., Schenectady, NY 12305, (518) 370-3747

Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12034, (518) 234-4600

Seneca R/C, 2339 Yorker Rd., Romulus, NY 14541, (315) 780-9343

Skaneateles Raceway & Hobby, P.O. Box 102, Rt. 20 W. Genesee St., Skaneateles, NY 13152, (315) 685-8077

Small Torque Racers of Long Island, 24 Horton Dr., Huntington Station, NY 11746, George Franz, (516) 271-1119

South Shore Hobby & Raceway, 311 W. Roe Blvd., Patchogue, NY 11772, Don Hauck, (516) 758-5587

Southern Tier Raceway & Hobbies, 88 Page St., Oswego, NY 13827, Chel, Anita Harding, (607) 687-5395

Team Earthquake, The Hobby House, 11412 Jones & Gifford Ave. Jamestown, NY 14701, (716) 488-1772

Transit Speedway & Hobbies, 5319 Transit Rd., Depew, NY 14043, (716) 684-7368

Whitestone Off-Road Raceway, 149-50 15th Rd., Whitestone, NY 11357, Whitestone Hobbies, (718) 767-6767

Joe's Hobby Shop & Raceway, Rt. 2, Box 682-B, Ressevoir City, NC 28016, (704) 435-2912

Mega Track of the Triad, 5540-105 Atlantic Springs Rd., Raleigh, NC 27604, Don Asplen, (919) 790-1444

Motorlead R/C Raceway, 125 Park St., Canton, NC 28716, (704) 648-7911

Mountain R/C Raceway, Hwy. 107N, P.O. Box 57, Glenville, NC 28736, (704) 743-3709

Outlaws Fasttrac Hobbies Raceway, 1013 Old Hendersonville Hwy., Brevard, NC 28712, Jeff Laws, (704) 885-RACE

PC Hobbies, 143 Industrial Dr., King, NC 27021, Mike Ingles, (919) 983-2514

Reedy Creek Raceway, Rt. 14, Box 946, Conrad Square Rd., Lexington, NC 27292, (704) 731-4022

Sandhills Raceway Inc., US #1, South Aberdeen, NC 28315, (919) 944-7414

Smiley Face Raceway, 120 W. Center St., Mebane, NC 27302, (919) 563-3822

Speed Performance, 4121 Lower Monrovia Rd., Sanford, NC 27330, Howard Everett, (919) 774-3843

TLC R/C Raceway, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028, (704) 492-7569

TNT R/C Raceway, 701 N. Salisbury Ave., Salisbury, NC 28159, Larry Martin, (704) 633-0647

Two Toms Hobbies, 155 Boone Square St., Hillsborough, NC 27278, Tom York, (919) 732-6221

Wilkes Hobby Supertrack, Rt. 1, Box 266-4, Ferguson, NC 28624, (919) 973-3734

Winston R/C Drag Series/Hobby Park, Dragway, W. Clemmonsville Rd., Winston-Salem, NC 27103, (919) 983-9416

Crystal Springs Off-Road, 1200 53 Ave. SW., Minot, ND 58701, (701) 852-9690

Hacienda Hills Speedway, 20 Hacienda Hills, Minot, ND 58701, Kenny Duchscherer, (701) 839-4419

Northern Mini Racers, P.O. Box 415, Minot, ND 58702, Patrick McWetly, (701) 839-8868

Granite City R/C Raceway, 192-1 E. Main St., Mt. Airy, NC 27030, (919) 786-1465

Hi-Performance Hobbies & R/C Raceway, P.O. Box 326, Ear, NC 28039, Dennis Hollifield, Steve Bliss, (704) 482-4391

Hobbies, Etc., 5540 Atlantic Springs, Raleigh, NC 27604, Don Asplen, (919) 790-1444

Hobby Park, W. Glenmorris Ille Rd., Winston-Salem, NC 27103, Dick Butler, Parks & Recreation, (919) 727-2063

The Hobby Speedway, Hwy. 25, P.O. Box 279, Naples, NC 28769, Jerry or Keith Rowers, (704) 684-9814

AAAction Speedway, P.O. Box 6, Morris, OH 43337, Tim McKnight, (614) 465-9891 or B. Harris, (614) 397-5912

ABD R/C Raceway, 5096 Rt. 127 S., Eaton, OH 45320, Aaron Garrett, (513) 452-1682

Alcraft's R/C Raceway, 1370 Guster-Orangeville Rd., Brookfield, OH 44003, (216) 448-1573

Alternative Racing Association, 2600 17th St., East Canton, OH 44730, Nea Everhart, (216) 484-2587

Buckeye Pulling Tracks, State Rt. 68, Xenia, OH 45395, Mark Harmons, (513) 376-8334

Classic Hobbies & Raceway, 2845 W. Waterloo Rd., Akron, OH 44312, (216) 628-3222

CJR Hobbies Top Race Track, 4916 Main Ave., Ashtabula, OH 44004, Virginia Gagal, (216) 992-3833

D&J R/C Raceway, 801 W. Market St., Oriskany, OH 44667, Don Yoder or Mark Missouri, (216) 682-4266

D&S Hobbies Raceway, 7791 Crite Rd., Concord, OH 44077, (216) 354-2112

FFA Speedway, 1001 Old Columbus Rd., Wooster, OH 44676, Roger Franks, (216) 264-1848

Flag City Raceway, 721 Rockwell Ave., Flag City, OH 44627, (216) 354-2112

Golden Bear Hobbies, 154 N. Melbourne Rd., Orville, OH 44667, Bob Roth, (216) 683-1250

Hi Tech Hobbies II, 116 S. Taylor St., Loveland, OH 45140, Rick Lewis or Richard Kosar, (513) 683-8900

Hobby Mania Raceway, 6597 Route 224, Loveland, OH 44636, (216) 536-8282

Innovative Hobbies/Lakeside Speedway, 3427 Manchester Rd., Akron, OH 44319, (216) 645-1333

JB Hobby & Raceway, 8760 St. Rt. 201, Tipp City, OH 45371, Bob Curtis, (513) 845-8222

KAR R/C Raceway, 14511 Seaco St., Salem, OH 44460, Reid Taylor, (216) 537-4939

Lewisberg R/C Raceway, 395 US Rt. 40, Lewisburg, OH 45338, Gene Butler, (513) 676-9201

Medina City R/C Raceway, 3414 Bensen Rd., Medina, OH 44256, Eric Pesto, (216) 723-0255

Paulding R/C Speedway, 103 N. Main, Paulding, OH 45879, Virgil Smidinger, (419) 238-0633

The Racer's Choice R/C Hobbies & Raceway, 1296 US Rt. 42, Mason, OH 45040, (513) 398-5539

RBI R/C Speedway, 110 Springdale Ave., Wintersville, OH 43952, Frank Lusk, (614) 264-9700

Right Choice Hobbies, 7760 Garrison Ave., Cincinnati, OH 45247, (513) 353-3343

Sleepy Hollow Raceway Park, 11189 Spear Rd., Concord, OH 44077, Gary Waidhelm, (216) 944-5898

Strongsville Speedway, 13315 Prospect, Strongsville, OH 44136, (216) 572-0430

Trusso's R/C Raceway, 100 W. Grain Ave., Kent, OH 44240, Ben, (216) 673-0422

Turn 4 Hobbies, 112 W. Main St., Van Wert, OH 45891, Virgil, (419) 238-6840

Way Out Hobbies, 5583 Centerpoint Rd., Georgetown, OH 45121, (513) 375-4984

Woodlane Raceway, 2300 F. Dorothy Lane, Dayton, OH 45470, Jeff Smiggin, (513) 298-1166

Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701, Kevin McKenna, (614) 455-3025

Coweta Hobby & Speedway, 310 S. Broadview, Coweta, OH 44429, Donald Seabolt, (918) 486-3948

Long's Left Lane, Rt. 13, Box 274, Wadonah, OK 74467, Scott Long, (918) 485-3706

Off-Road Car Assoc. of Tulsa, 1924 W. Pittsburg Ct., Broken Arrow, OK 74012, Mark Sear, (918) 496-8961

R/C Auto Racing, 501 Westland Dr., Edmond, OK 73034, Gary Garrett, (405) 348-3253

RCAR, 16151 St. E. & 81st St., S. Broken Arrow, OK 74014, Dave Cole, (918) 663-8998

RCRC, 430 S. Vermont, Suite 104, Oklahoma City, OK 73108, Rick or Steve, (405) 947-7223

Sundown Raceway, 626 Magna Ave., Poncha City, OK 74661, Ryan Trant, (405) 265-2832

Wild Country Speedway, 127 South Main, Portland, OK 74454, Charles McElkinnigh, (918) 685-0372 or 687-1686

Aero Sports & Hobbies, 17941 NE Gasser, Portland, OR 97230, Mike Taylor, (503) 669-7665

Fast Track Recreations, 16023 SE Adde Rd., Milwaukie, OR 97167, Dale Nelson, (503) 659-7661

The Finish Line R/C Raceway, 560 W. D. St., Apt. 6, Canby, OR 97126, Rod Carothers, (503) 895-4395

Mt. Bachelor Radio Raceways, 225 Centara Dr., Bend, OR 97701, Rex Boldwin, (503) 389-6160

North Lawrence Raceway, 36 N. Lawrence, Eugene, OR 97461, Gary Hill, (503) 484-9857

R/C Plus Hobbies Raceway, 2029 25th St. SE, Salem, OR 97302-1130, Ron Smith, (503) 364-9188

R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501, (503) 779-8298

Yamhill County R/C Car Club, 722 Morgan Ln., McMinnville, OR 97128, Larry Rucker, (503) 477-7234

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AAAction Speedway, P.O. Box 6, Morris, OH 43337, Tim McKnight, (614) 465-9891 or B. Harris, (614) 397-5912

ABD R/C Raceway, 5096 Rt. 127 S., Eaton, OH 45320, Aaron Garrett, (513) 452-1682

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Right Choice Hobbies, 7760 Garrison Ave., Cincinnati, OH 45247, (513) 353-3343

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Way Out Hobbies, 5583 Centerpoint Rd., Georgetown, OH 45121, (513) 375-4984

Woodlane Raceway, 2300 F. Dorothy Lane, Dayton, OH 45470, Jeff Smiggin, (513) 298-1166

Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701, Kevin McKenna, (614) 455-3025

Coweta Hobby & Speedway, 310 S. Broadview, Coweta, OH 44429, Donald Seabolt, (918) 486-3948

Long's Left Lane, Rt. 13, Box 274, Wadonah, OK 74467, Scott Long, (918) 485-3706

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R/C Plus Hobbies Raceway, 2029 25th St. SE, Salem, OR 97302-1130, Ron Smith, (503) 364-9188

R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501, (503) 779-8298

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A-1 R/C Speedway, 15 S. Hanover St. Hummelstown, PA 17036. Cyne Felker. (717) 566-3335

ACORN

Ansolan, 54 High St., Fairchance, PA 15436. Timothy Abraham. (412) 564-9956

B&B Raceway, 252 Geiger Rd. Philadelphia, PA 19115. Ron Smith. Doug or Dave Brinsley. (215) 686-6086

BU's Hobbies & Raceway, 570 E. Camping Area Rd. Whitville, PA 17365. Janet & Allen Wiley. (717) 292-3723 fax. (717) 292-3584

Brian's Raceway, 133 Flexer Ave. Altoona, PA 16813. (215) 435-1862

CEB Motors R/C Div., 5743 Moir Pitcher Hwy. Marietta, PA 17235. Charlie Rouse. (717) 375-4635

Clearfield R/C Car Club, P.O. Box 297. Clearfield, PA 16834. Joe Welch. (814) 765-3045

Cressona Mall Speedway, Rt. 61. Pottsville, PA 17901. (717) 385-3506

Curly's Hobby Shop, 4455 W. Ridge Rd. Hickory, Plaza Erie, PA 16506. (814) 835-1134

DARCAR, Rt. 1, Box 270. DuBois, PA 15801. (814) 475-0687

Denwick R/C Hobbies & Raceway, 5631 Lincoln Way East. Fayetteville, PA 17222. Charles Gartenhour. (717) 352-8899

Dreamboat Hobbies, 2810 Pennsylvania Ave. W. Warner, PA 15365. Irene Durska. (814) 723-8052

East St. Raceway & Art Center, 747 F. Railroad Ave. Verona, PA 15147. (412) 826-0607

East St. Raceway, 736 East Railroad Ave. Pittsburgh, PA 15147. Steve Mapple. (412) 826-3242 (412) 826-0602

Henning Scale Models R/C Raceway, 178 S. Linn St. Lansdale, PA 19446. Bill Henning. (215) 962-2442

High Tek Hobbies, 12250 Rt. 30 N. Huntingdon, PA 15642. Ken Brooks. (412) 864-5278

Hipkins Hobbies Raceway, 402 W. Azendale-Rock London. West Grove, PA 19390. Doug Hipkins. (215) 869-8585

Hobby America Raceway, 5425 S. Harris St. Duke Center, PA 16729. Dan & Mike Coast. (814) 966-3765

Hobby Heaven, 1845 Rt. 422 West Indiana, PA 15171. Scott McAdoo. (412) 463-8019

Hobby House Raceway, Downingtown Marketplace, Downingtown, PA 19335. J.T. Nelson. (215) 269-1300

Hobby World Raceway, 172 Shillington Rd. Sinking Spring, PA 19608. Mike Wentzel. (215) 678-8760

JR Hobby Shop & Raceway, 1806 Maple Rd. Erie, PA 16501. Ron Bradner. (814) 898-1816

Koontz's Home & Hobby Center, 1205 River St. Pittsburgh, PA 15204. (412) 331-3806

L&R R/C Racing, 15 S. Main St. Red Lion, PA 17356. Larry & Randy Shoemaker. (717) 244-1108

Main Hobby Race Center, 501 E. Lackawanna Ave. Blythport, PA 18447. Dave or Ed. (717) 489-4566

Marshall's R/C Raceway, RR 4, Box 640. Hersedale, PA 18431. Bill or Dot Marshall. (717) 729-7458

Modelbahn Old Hobbies, 1145 E. Philadelphia Ave. (Rt. 731) Gilbertsville, PA 19525. (215) 367-5925

Mountain R/C Raceway, 918 S. Park Ave. Somerset, PA 15501. Bob Rhodes. (814) 445-0085

Mt. Laurel Speedway, 835-S. Heister Lane. Reading, PA 19605. Joe Vaccaro. (215) 921-0176

New Garden Farms/Mushroom Bowl, 812 W. Cypress St. Kennett Square, PA 19348. Drew Pannell. (215) 444-1850

Performance Hobby, 1305 Main St. Slatington, PA 18080. (215) 760-9855

Pit Stop Hobbies, 262 W. Main St. Mount Joy, PA 17552. James F. Stovet. Jr. (717) 653-6222

Pro Challenge Raceways, Wycombe Ave. (P.O. Box 536). Lansdowne, PA 19050. Bob Balowin or Bob Paulange. (215) 622-7651

Prop & Wheels Raceway, 139 W. Broadway. Tamaqua, PA 18252. (717) 668-2288

R&D Hobbies & Raceway, 5101-C. Jonesboro Rd. Harrisburg, PA 17112-2924. Craig B. Shoen. (717) 545-4984 fax. (717) 545-5306

Race Place Hobbies, 201 Station Rd. Chakertown, PA 18951. (215) 538-2394

Radio Controlled Pro Speedway, Rt. 487N. Stillwater, PA 17878. (717) 387-0266

RCO Raceway, 519 Broadway. Hanover, PA 17331. Chris Shaffer. (717) 633-9490

Riverside Raceway, PA Ave. W & Hickory. Warren, PA 16265. Jeff. (814) 725-4711

Rolling Wheels, West Hills Shopping Center. Coatesville, PA 15108. Peggy. (412) 262-4858

South Mountain R/C Speedway, 357 Furnace Rd. Wernersville, PA 19605. George Merkel. (215) 267-4736

Staub Bros. R/C Speedway, 31 Locust St. Gettysburg, PA 17325. Todd or Scott Staub. (717) 334-5445

T&T Radio Controlled Racing, Randolph Rd. Great Bend, PA 18821. (607) 723-9357

TC's R/C's, 1537 Freeport Rd. Natrona Heights, PA 15065. Tom Corlate. (412) 226-8802

Trains and Lanes, 3812 Newburg Rd. Easton, PA 18042. Jeff Selter. (215) 253-8850

Wagonhill Hobbies, 967 New Castle Rd. Rt. 422. Butler, PA 16001. Jeff Hvard. (412) 865-9877

PUERTO RICO

Cachon Off-Road Track, Box 952. Baranquitas, PR 00794. (809) 857-0341

East Bay Hobbies, 629 Melacoin Ave. Bristol, RI 02809. (401) 254-0178

R/C Hobbies, 47 Sandybottom Rd. Coventry, RI 02816. (401) 823-4335

Tri-State R/C Raceway, 265 Halene Rd. Warwick, RI 02886. Raymond Dean. (401) 738-4908

RHODE ISLAND

Bandits Performance R/C Hobbies, P.O. Box 1533. Dartmouth, SC 29532. Bryan Howler. (803) 393-3333

Berea R/C Speedway, 707 Sulphur Springs Rd. Greenville, SC 29611. (803) 246-4700

Capitol City Raceway, 1955 Lagrand Rd. Columbia, SC 29223. Lee Moulter or Brooks Shealy. (803) 788-7749 or 788-4669

HMW Hobby Shop & R/C Raceway, 4930 Dorchester Rd. North Charleston, SC 29418. Brian G. Heath. (803) 760-1578

Inland R/C Speedway, 61 New Ground Lane. Myrtle Beach, SC 29577. James Walter. (803) 293-1753

Mid-Carolina R/C Superspeedway, 2222 Wintercrest Dr. Rock Hill, SC 29732. Fred Penland. (803) 328-8278

Monaco's Raceway, 727 E. Buena Vista Ave. N. Augusta, SC 29841. B. Courson. (803) 279-8982

Palmello Raceway, 5023A Rivers Ave. N. Charleston, SC 29418. (803) 586-0068

R/C Speed Shop & Raceway, 2122 Platt Springs Rd. W. Columbia, SC 29169. Eric Prevost. (803) 791-4715

Sidewinder's R/C Raceway Park, 1601-B West Enterprise St. North Charleston, SC 29406. Jimmy Closson. (803) 744-7441

Simpsonville International R/C Speedway, 3009 Belhel Rd. Simpsonville, SC 29681. Larry Chappell. (803) 297-3572

TBS Superspeedway, 800 Hwy. 15N. Harrisville, SC 29550. Johnny Turner. (803) 332-7177

SOUTH CAROLINA

CSF Speedway, Central States Fairgrounds. Creative Arts Bldg. 800 San Francisco St. Rapid City, SD 57702. Scoop Laskowski. (605) 342-5292

Dakota Off-Road Racers, 2989 W. Br. Co. 12. Aberdeen, SD 57401. (605) 226-0604

1/8-Scale Off-Road, 2989 W. Br. Co. 12. Aberdeen, SD 57401. Brian Bourdon. (605) 225-0803. (evening) 226-0604 (day)

SOUTH DAKOTA

AA Raceway, 1617 Toney Rd. Austin, TX 78704. (512) 474-8277

Anchor Acres Raceway, 1101 Sheppard Rd. Baytown, TX 77654. Bob & Patricia Vea. (817) 569-4707

Austin R/C Center, 3702 Gray Blvd. Austin, TX 78758. Caton Cobb. (512) 932-8144

Bay Area R/C Raceway, 2802 Egar St. Rapid City, SD 57702. Rex Conrad. (605) 341-2186

Budget Raceway, RR 1, Box 406. Brainerd, MN 56301. (814) 859-5296

Checked Raceway, 1121 Perimeter Park, Suite 214. Houston, TX 77099. Rick Ward. (713) 849-3954

Dave R/C Speedway, 460 South 135. Brainerd, MN 56301. Curtis A. Rowe. (817) 251-1150

Eagle Hobby Center, 3601 Shepherd Balch Springs, TX 75181. Terry Crowe. (214) 251-5220

Eastex Raceway, 45300 Hwy. 59 N. New Caney, TX 77357. Wendy Fiske. (713) 399-1527

Hall's R/C Raceway, 1440 Ressemmer St. Pico, TX 79936. (915) 591-2213

Heart of Texas Hobbies & Raceway, 309 W. Hwy. 190. Cleburne, TX 76032. Lutz Glesner. (817) 547-5595

Hi-Tech Hobbies & Raceway, 1107 Post Neches Ave. Port Neches, TX 77651. (409) 724-2315

Indy R/C World, 250 Mesquite Village. Mesquite, TX 75150. (214) 696-1744

J&K Speedway, 201 Enterprise Row. State 101. Commerce, TX 77301. J&K Hobbies. (409) 660-1986

R/C Pro Shop, 17207 West County Road #29. Odessa, TX 79765

Randy's Hurricane R/C Speedway, 9506B Old Knt. Rd. Houston, TX 77055. Randy Munchen. (713) 464-8020

Rebel Hobbies & Raceways, 11925 Jones Millhopper. San Antonio, TX 78218. George Morris. (214) 496-2396 fax. (214) 496-3294

Rivercity Speedway, 11731 Wetmore. San Antonio, TX 78247. Ralph Hernandez. (214) 359-6870. Joe Toledo. (214) 341-5632

Ron's R/C Hobbies & Raceway, 2551 Commodity. Dallas, TX 75220. Ron Salsim. (214) 357-3453

Smitty's Hobbies & Raceway, 6021 Dayton Blvd. Chattanooga, TN 37415. David Smith. (615) 877-9347

Tuckasee Off-Road Raceway, 1004 Lafayette Rd. Clarksville, TN 37042. Dennis Hayward. (615) 645-2635

AA Raceway, 1617 Toney Rd. Austin, TX 78704. (512) 474-8277

Anchor Acres Raceway, 1101 Sheppard Rd. Baytown, TX 77654. Bob & Patricia Vea. (817) 569-4707

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Smitty's Hobbies & Raceway, 6021 Dayton Blvd. Chattanooga, TN 37415. David Smith. (615) 877-9347

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Eastex Raceway, 45300 Hwy. 59 N. New Caney, TX 77357. Wendy Fiske. (713) 399-1527

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Hall's R/C Raceway, 1440 Ressemmer St. Pico, TX 79936. (915) 591-2213

Heart of Texas Hobbies & Raceway, 309 W. Hwy. 190. Cleburne, TX 76032. Lutz Glesner. (817) 547-5595

Hi-Tech Hobbies & Raceway, 1107 Post Neches Ave. Port Neches, TX 776

Track Directory

Southside R/C Raceway, 4409 FM2351, Friendswood, TX 77546. Roy Boxler, (713) 932-3541

Spring Creek R/C, 45 Fisherman's Rd., San Angelo, TX 76904. (915) 944-3850

Star R/C Hobbies, 803 Garcia St., Port Isabel, So. Padre Island, TX 78578. Fred Carr, (512) 943-7546

T&T Eagle, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023. Tony Weinburn, (214) 517-0562

Texas Speedway, 8707 Chimney Rock, Houston, TX 77029. (31) Hobby Center, (713) 661-7737

TK's R/C Park, 2921 Old Claude Hwy., Amarillo, TX 79101. (806) 622-0017

Ty's Toys & Raceway, 129 John Stockbauer, Victoria, TX 77901. Ty Dorsey, (512) 575-6154

Wes Hobby, 980 S. 4th St., Beaumont, TX 77701. Edmond Richards, (409) 839-4929

Wild Bill's, 535 E. Shady Grove, Irving, TX 75060. Lynn Morgan or Jerry Williams, (214) 438-9224

Z Track, 1563 Dunnham Dr., Abilene, TX 79602. Ch. Chu, (817) 692-8477

UTAH

Hansen Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84043. Kevin Hansen, (801) 250-8303

High Anxiety, 271 N. Donlee Dr., St. George, UT 84770. (801) 673-9331

Power Hobbies & Raceway, 135 N. 900 East Suite 7, St. George, UT 84770. April Nutley, (801) 628-8747

Vision Hobby Raceway, 3528 N. State St., Great Salt Lake, Vision Hobby, (801) 226-6226

WOR (Wasatch Off-Road Raceway), 3170 Brinker Ave., Ogden, UT 84401. J. Male Hobbies, (801) 733-0933

VERMONT

Green Mountain Superspeedway & Hobbies, Fm. St., Windsor, VT 05404. Charles Barsalov, (802) 893-2660

Hard Rock Raceway, Ashtachan Dr., Bennington, VT 05201. Darren Ricchi, (802) 447-7656

Mike's Hobbies & Raceway, 152 N. Main St., Rutland, VT 05701. Stephen Rachis, (802) 775-0059

Riverside R/C Speedway, Boyz R/C Hobbies, 700 Elm St., Windsor, VT 05404. Charles Barsalov, (802) 893-2660 or 893-2332

VIRGINIA

A-1 Raceways, 94C Radford Rd., Christiansburg, VA 24073. Kay or Charles Franks, (703) 381-9731 or 382-1173

Bob's Hobbies & Raceway, 910 J. Brandy Creek Dr., Mechanicsville, VA 23111. Bob Wagner, (804) 746-7758

Cooper's R/C Raceway, Rt. 4, Box 12203, Chatham, VA 24531. (804) 724-4182

Crossroads Hobbies R/C Raceway, 1104 W. Main St., Salem, VA 24153. Ronnie Black, (703) 387-3414

Front Royal R/C Racing Association, P.O. Box 1252, Front Royal, VA 22630. Pete Pomeroy, (703) 636-6149

H&S R/C Raceway, 565 Electric Rd., Salem, VA 24153. Henry David or Stacy LaPrade, (703) 343-4012

Hobby Hangar Speedway, 4433A Brookfield Corp. Dr., Chantilly, VA 22021. Kwang Ko, (703) 631-8820

KC's Radio Control & Repair, Rt. 4 Box 312, Trents Ferry Rd., Lynchburg, VA 24503. Curtis or Kim Wright, (804) 384-8596

Lana's End Raceway, P.O. Box 153, Bridgegate, VA 22812. Tony Strother, (703) 828-6655 or 3471

Mid Atlantic Raceway, 89 E. Elizabeth St., Hainsburg, VA 22801. (703) 433-3952

NSWC MWR R/C Track, C1243C Dahlgren, VA 22448. Doris Copen, (703) 663-1730

Sterling Truck & Auto Racers, 20921 Davenport Dr., Sterling, VA 22170. Ron Beckman, (703) 444-0333

The Tillyard, Rt. 1, Box 235A, Dayton, VA 22801. Homer W. Altman Jr., (703) 828-3471 or 828-6655

Trainland R/C Club, 5661 Snowloers Hill Rd., Suffolk, VA 23435. Frank Stevens, (804) 483-2331

Winners Circle, 3236 W. Clay St., Richmond, VA 23230. (804) 355-7076

WASHINGT

Alfie's, 108 South K St., Aberdeen, WA 98520. (206) 533-6638

Arlington Heights Speedway, 13629 228th St. NE, Arlington, WA 98223. Shawn Bussert, (206) 435-3442

Firegrove TNT Raceway, 10611 136th E., Puyallup, WA 98374. Walt Hale, (206) 845-7675

Four Seasons R/C Racing, 146 School St. SE, Olympia, WA 98506. (206) 491-2430

Hank Perry Race Complex, Sullivan Rd., WA 99213. (509) 927-1879

L&L R/C Raceway, 15818 SE. 287th, Kent, WA 98042. Eric Lake or Bob Lewis, (206) 839-1241 or 631-1664

MacDonald R/C Speedway, 12822 307th Ave. SE, Sultan, WA 98294. Brett MacDonald, (206) 793-1886

NORA Performance R/C, P.O. Box 955 (1673 Cedarvale Rd.), Mt. Vernon, WA 98273. (206) 755-9464

Schmidt's Auto Parts, 10305 Old Hwy. 99, Marysville, WA 98271. Jon Failla, (206) 653-8838

NORRAC Raceways, 1810 S. Park St., Madison, WI 53713. Jeff Gundlach, (608) 273-0519

Midwest Tri-Clone, 144 N. Main St., West Bend, WI 53095. (414) 334-0487

Muskyland R/C Raceway, P.O. Box 1043, Hayward, WI 54843. Hayward R/C Wheels Club, (715) 482-3312

Pacific R/C Club, W7990 Hwy. P., Pardeeville, WI 53954. Allys Brenner, (608) 742-7103

The Pitts Hobby Shop, 786 Morris Ave., Green Bay, WI 54304. (414) 494-4200

R/C Hobby Off-Road Track, Johnson Lane, Viradua, WI 54685. Dan or Diane Sawell, (608) 537-8221

R/C Raceway, 2239 City Rd. E., Bklyn, WI 54002. Lance Van Damme, (715) 684-2690

R/C Raceways & Hobbies, 181 W. Marquette Ave., Oak Creek, WI 53154. Ralph & Cathy Angustino, (414) 764-9701

R/C Spectacular, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227. (414) 327-3999

Radio Mania, 129 Harrison St., North Prairie, WI 53153. Bill Bowes, (414) 392-9515

Sparta R/C Raceway, Golf Course Rd., Sparta, WI 54656. Eric Johnson, (608) 269-5861 or 269-6613

Stollz Raceways, 548 Summit Dr., West Bend, WI 53095. (414) 338-6097

Trackside Raceway, 4405 W. Bradley, Milwaukee, WI 53223. Joel Gish, (414) 355-1910

West Bend Hobbies, 144 N. Main St., West Bend, WI 53040. (414) 334-0487

WEST VIRGINIA

Fairmont R/C Raceway, 430 Fairmont Ave., Fairmont, WV 26554. Ed Kirby, (304) 363-5509

Fulton's R/C Raceway, 2646 Chapline St., Wheeling, WV 26003. James Fulton, (304) 233-5355

R/C Race Place, Rt. 10, Box 351, Morgantown, WV 26505. (304) 292-0811

WISCONSIN

ABC R/C, 1441 E. East Main St., Waukesha, WI 53186. Dick, (414) 542-1245

Arena Park Raceway, Kaukauna County Parks, 7727 60th Ave., Kaukauna, WI 53142. David Delahio, (414) 657-6371

Fox Valley Off-Road Racing Club, Rt. Mayflower Rd., Hortonville, WI 54944. (414) 739-9211

Frog's R/C Raceway, Rt. 1, Phillips, WI 54555. (715) 339-2314 or 339-2958

Gary's Hobby Center, 3701 Durand Ave., Racine, WI 53403. Ron, (414) 564-8884 or 1-800-894-6229

Grant County Speedway, 2125 Oak Hazel Green, WI 53811. Brad Birkette, (608) 854-2246

Hobbytown Speedway, 4231 8th St. S., Wisconsin Rapids, WI 54494. (715) 421-1222

JJ's Dirt Heaven, 6028 County K., Champion, WI 54229. (414) 866-9096

Maniac Motors Raceway, 244 Rt. 1 A1, Rt. H. Kendall, WI 54638. (608) 482-8935

MARCCA Raceways, 1810 S. Park St., Madison, WI 53713. Jeff Gundlach, (608) 273-0519

Midwest Tri-Clone, 144 N. Main St., West Bend, WI 53095. (414) 334-0487

Muskyland R/C Raceway, P.O. Box 1043, Hayward, WI 54843. Hayward R/C Wheels Club, (715) 482-3312

Pacific R/C Club, W7990 Hwy. P., Pardeeville, WI 53954. Allys Brenner, (608) 742-7103

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R/C Raceway, 2239 City Rd. E., Bklyn, WI 54002. Lance Van Damme, (715) 684-2690

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Radio Mania, 129 Harrison St., North Prairie, WI 53153. Bill Bowes, (414) 392-9515

Sparta R/C Raceway, Golf Course Rd., Sparta, WI 54656. Eric Johnson, (608) 269-5861 or 269-6613

Stollz Raceways, 548 Summit Dr., West Bend, WI 53095. (414) 338-6097

Trackside Raceway, 4405 W. Bradley, Milwaukee, WI 53223. Joel Gish, (414) 355-1910

West Bend Hobbies, 144 N. Main St., West Bend, WI 53040. (414) 334-0487

WYOMING

Collectable Creations Off-Road Oval Track, 1790 Dell Range Blvd., Cheyenne, WY 82009. Phil Severson, (307) 632-2156

AUSTRALIA

Wodonga R/C Car Club, 11 Murphy St., Wodonga, VIC 3690. Ron Langman, (011) 6160-247-128

Aubry R/C Car Club, Aubry Showgrounds, Aubry, NSW 2640. Ron Langman, (060) 247-128

BRAZIL

Hobby Center, SQS 210 Bl. H Apt. 204, Brasilia, DF-Brasilia 70 273. 061-242-0488

Off Roaders, Av. Guillerme Dumont, Vilas, 317 Sao Paulo, CEP 05640. Valdir Telpe, (055) 011-263-5628. fax (055) 011-831-4931

Way of R/C Off-Road Cerrado, Rua Fernandes Tourinho 999, 4th Floor, Belo Horizonte, MG. Claudio Taccaro Correa, (55) 31-723-3676

CANADA

Aprilia Track, 20 Parsons Ridge, Kariata, Ontario K2L 2N4. (613) 836-2577

ATN, 2000 Paul Hubert, Quebec J0G 1E0. Louis Durand, (819) 293-6097

Autodrome des Prairies, 935 Blvd. St. Luc, St-Luc, Quebec J0J 2A0. (514) 348-0718

Cactus Speedway, Con. #3 Rutliff at Colasanti's, Rutliff, Ontario N8N 2W6. Larry Fitzpatrick, (519) 735-3039. Wayne Telasco, (519) 966-0702

Circuit R/C Bonzai, 164 Cowie, Granby, Quebec J2G 3V3. (514) 372-3627

Crash Course, Box 9, Ste. 8, RR #1, Spruce Grove, Alberta T7X 2T4. Tim Shattrevel, (403) 963-5795

Dynamic Hobbies, 21 Concourse Gate, Unit 6, Nepean, Ontario K2E 7S4. Clark Fiebert, (613) 225-9634

The Glass Castle Off-Road, RR #7, Trans Canada Hwy., Duncan, BC V9L 6P4. Don Douthright, (604) 746-6518

GRSCR, 9 Gauthier, St de L'Acigau, Quebec J0K 3H0. (514) 588-4754

Honda House Motor Speedway, 364 Richmond St., Chatham, Ontario N7M 1P9. John Elliot, (519) 354-5530

Interior R/C Racers, 311-1780 Spruquiew Pl., Kamloops, BC V2E 1J4. Martin Vannieuwenhuizen, (604) 374-1268

IRCCC Off-Road, Hartland Rd., Victoria, B.C., Gary Allen, (604) 478-8004

Ivan's Playground, 2220 Dewdney Ave., Regina, Sask., S4R 1H3. Ivan or Conrad, (306) 757-8881

J-T International Raceway, 127 Melgar Lane, Nanaimo, Ontario K7R 8A1, N. O'Neill, (613) 354-0099

Kamloops Dirt Burners, 311-1780 Spruquiew Pl., Kamloops, BC V2E 1J4. Martin Vannieuwenhuizen, (604) 374-1268

Kiwanis Radio Control Club, 410 Spruce St., Timmins, Ontario P4N 4S7. Al Bracey, (705) 267-1569, fax (705) 268-9129

Krazy Trak, 2417 M-Ln. Ave., Saskatoon, Sask. Brian & Ruth Keidel, (306) 221-7344

Mackay Raceway, 1061 W. 14th St. (Mackay, Park), North Vancouver, B.C. R.C. Steve Mulih, (604) 984-0987

Maple Grove R/C Track, RR #3, Brockville, Ontario K6V 5T3. Ray Groux, (613) 342-5549

MDRRAC Raceway, 5449 Crossfield Tr. SW, Box 36060, Calgary, Alberta T3F 7C8. Gary Fiege, (403) 254-1386

Niagra R/C Speedway, 1874 Hwy. 20, Thorold, Ontario, Steve Ingram, (416) 892-5548

Northern Alberta Scale Car Auto Racers, 1142 Knottwood Rd. E., Edmonton, Alberta, T6K 2J8. Dean Simpson, (403) 461-3432

Quintrax Speedway, Box 1034, Savelle, Ontario K8N 5B5. (613) 962-1414. fax (613) 962-7306

Radical Raceway, 150 Broadway Drive, Unit 25, Concord, Ontario L4K 1K8. Roland Glass, (416) 660-5238

Circuit St-Denis Auto Teléguides, 292 DuLion, St-Denis sur Richelieu, Quebec J0H 1K0. Francois Rivard, (514) 787-1127

Circuit Teleguide Ville Mercier, 1101 St. Jean Baptiste, Mercier, Quebec J6R 1C6. Norm Foster, (514) 699-4003

Club AVATI, 244, rue Hotel de Ville, Deauville, Quebec, Daniel Vanier, (819) 864-6262

Rouillon Hobby Track, 177-D St-Jean Baptiste, Chateauguay, Quebec J6K 3B4; (514) 698-2151

RROL, Nordon Restaurant, Hamilton Rd. at Commissioners Rd., London, Ontario; Mark Hennion, (519) 457-2758

Seaway Valley R/C Raceway, RR 1, Iroquois, Ontario K0E 1K0; Orville or Carol Smyth, (613) 652-4953

Thunder Alley, 1380 London Rd., Sarnia, Ontario N7S 1P8; Rob Smith, (519) 882-3361

Top Qualifier Race Club, McKay Park, North Vancouver, B.C.; Derrick Vandekraats, (604) 985-3948

Union Creek Speedway, 281 Henderson Highway, Winnipeg, Manitoba R2L 1M4; MRCAR c/o Kelvin Community Centre, (204) 667-9186

Universal R/C Speedway, Niagara St., Welland, Ontario; (416) 735-5051

West Coast R/C Raceway, 190-7771 Alderbridge Way, Vancouver, B.C. V5C 3A3; Michael Ma or Kelly Ho, (604) 276-8779

WORRC, 861 Isack Dr., Windsor, Ontario N8S 3W6; Pete Adams, (519) 944-8519 or 974-3346

Woodstock Speedway, Queen St., Woodstock, NB; Woodstock Hobby, (506) 325-2067

DENMARK

Rainbow Raceway, Eriksvej. 9 Glostrup, Copenhagen 2600; P. Christiansen, 011-45-52-848-504

FRANCE

Auto Electron, 35, rue B. de Ventadour, Limoges, France 87000; M. Boudoul, 55 062763

HONDURAS

Autodromo Accion, Quinta Santa Maria, San Pedro Sula, Honduras, Colonia Rivera Hernandez; Eduardo Hondal, (504) 52-2061

INDONESIA

Beverly's Racing, Palm St., 188, Surabaya, Jatim, Indonesia; Jhon Mudik, 011-62-31-595-888

ISRAEL

Nahshoneal, Abba Nile Silver Str. 64, Haifa, Israel 32809; Golan Levy, (972) 039386444 or (972) 04231252

JAPAN

Courtney Off-Road, Camp S.D. Butler, Okinawa, Japan, FPO AP 96379; USMC Arts & Crafts, 011-81-61173-53674

Foster R/C Raceway, Camp S.D. Butler, Okinawa, Japan, FPO AP 96379; Camp Foster Arts & Crafts, 011-81-61173-53674

Hansen Off-Road, Camp S.D. Butler, Okinawa, Japan, FPO AP 96379; USMC Arts & Crafts, 011-81-61173-53674

Iwakuni R/C Track, PSC 561, Box 978, FPO AP 96310-0978; David T. Eck, 011-81-6117-53-3662

Misawa R/C Raceway, 13th Fighter Squadron, PSC 76, Box 2585, APO AP 96139-2585; 011-81-176-53-5181, ext. 226-6506

Yokata R/C Racers, Yokata Air Base, Tokyo Fussa-Shi, Japan 96326; June Uchiyama, 0425-54-6942

Zama Off-Road Raceway, 17th ASGCM Unit 45013, Box 3232, APO AP 96338 Japan; SFC Ken Campbell, 011-81-3117-63-8478

MEXICO

Alces Off Road, Lopez Mateos y Rayod S/N, Ensenada, Baja California, BC 22830; Jorge Bustamante, (667) 6-1476, 61477, 86729

Baja Jr., Lopez Mateos Y Poseidon, Los Mochis Sinaloa; Gabriela Macias Memo Asencio, (681) 2-0276

Hobby Centro, 12 De Diciembre No. 3070-A, Guadalajara, Jal. 45550; Alejandro Ortiz Del Toro, (36) 21-46-28

Hobby's Formula, Au observatorio 457 DF 01120; (905) 502-3620

Hobby Model's Raceway, Blvd. Garcia de Leon, 1555, Morelia, Michoacan 58260; (431) 5-01-22

Jaguar R/C Club, Calz. Zavaleta 116, Puebla 72150; Chema, Denise or Chiro, (22) 31-00-91, (22) 33-00-94

La Hielera, Prol Corregidora Nte 350, Queretaro, QRO C.P. 76160; Jorge Morelos Rabell, (42) 12-15-25

Pista Casino, Hotel Casino de la Selva, Cuernavaca, Morelos 16507; Luis Duhart, (73) 19-12-38

R/C Racing Club, Obsidiana #2900, Zapopan, Jalisco 44560; Fernando Hernandez, (3) 616-73-47

Tony's Track, Obregon 364 Sur, Culican Sinaloa; Guillermo Prieto, (67) 165708-168141

NEW ZEALAND

Counties R/C Raceway, Pukekohe Showgrounds, Station Rd., Pukekohe, New Zealand; R. Northcott, 09 23 86904

Papakura Indoor R/C Car Club, 25 Tairere Cres., Papakura, Auckland; Colin Perry, (09) 298-4711

SPAIN

Outlaw-Ultima II, Puerto Rico 27, Madrid, Spain 28016; Juan Vacas, (34) 915197298

ROARCR, Naval Station, Rota, Spain (P.O. Box 53, FPO NY, NY 09540-0013); PO Kelly Sexton, 011-34-56-822652

SWITZERLAND

JMRCV-Terraindu Levant, Chemin ou Levant, 1290 Versoix, Geneva, Switzerland; fax, 19 41 22 7790805

VENEZUELA

Las Fuentes R/C Club, 2da Calle las Fuentes El Paraiso, Caracas, DF 1020; Franco Agrusa, (02) 461-72 55

WEST INDIES

Island Raceway, 8 Mile Post Jacks Hill, St. Andrew, Jamaica, West Indies; Rodney Littau, (809) 926-7034 or 927-1198

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RACE OF CHAMPIONS

(Continued from page 108)

guys were fast and were definitely *not* messin' around! Masami was smokin'—so fast that I could hardly believe it. I had the impression that, on the back straight, if he gave his car too much throttle, it would flip over backwards. I was impressed by his ability.

Even though the track was on the tight side, the racing was very clean—no deliberate hacking.

J.D. Beckwith started slowly but later gathered speed and won three of his six rounds. Matt Ledger and Brian Kinwald also turned some extremely fast lap times, and both won two out of six. Brent Wallace, Kevin Moore, Matt and Mark Francis, Mark Pavidis, Satoshi Kayano, Craig Drescher, Jack Johnson, Scott Anfinson, Rick Hohwart, Daren Westman and Bryan Peterson had impressive heat wins.

But when the smoke had cleared, Masami had taken the overall win with 9 points; J.D. finished a close second with 11 points, and Matt Ledger was right behind him in third.

OPEN CLASS

• **2WD.** Scott Hughes—formerly of Team Losi, but now running for Team Associated—not only TQ'd, but he also dominated to clinch the overall A-Main win. Look for him in the Invitational Class next year!

Team Losi's Vince Stollo, running really fast lap times with his Pro SE, also caught my eye. Look for more from him in the future, too.

James Brown and Greg Hodap both turned in some fast laps, while Jason Rudee and Jason Ronas placed second and third, respectively, behind Scott Hughes.

• **4WD.** Last year, Brent Wallace won overall in 4WD, but this year's honor fell to 2WD top qualifier and eventual 2WD winner, Scott Hughes. Aaron Biner followed Scott, and third place went to Chris Walrod.

4WD INVITATIONAL

Last year, the man to beat in this category was Masami Hirotsuka; would it be the same this year? Well, after watching the first round, I couldn't guess who'd win.

In one race, with all his "hairball" passes, it looked as if Jay Halsey would be taking his Schumacher BossCat to the winners' circle. In one triple section that turns to the right straight after the third jump, Jay pulled off the pass of the weekend as he hit the section just right, tripled it as a slower car was doubling it, then single-jumped the last jump.

In one heat, Derek Furutani looked good as he held off a hard-charging Masami, and Cliff and Mark Pavidis put on a good show, too. J.D. turned in some really fast laps; out of six

rounds, he won one and placed second three times.

At first, Masami, J.D. and Brent Wallace swapped the lead, but Wallace took command after round two and won every one of his heat races with his Schumacher BossCat.

TALLY TIME

At the end, when all the points had been tallied, Masami was victorious in 2WD and second overall in 4WD, so he was acclaimed the '93 Reedy Race of Champions title holder. J.D. was four points behind in second place, and Ledger, Kinwald and Wallace rounded out the top five. We at *Car Action* congratulate Masami on his decisive win, and we thank every competitor who made the trek to Livermore for this great race. See ya next year! ■

LETTERS

(Continued from page 9)

OLD OBSESSION

I'm a faithful reader of your magazine. I need to know if I can get some pictures and some other information about the old Tamiya Bruiser. I'm obsessed with this old truck. I also want to know if there are any readers out there who have parts for it that they'll get rid of.

DERRIC OTTO
St. Anthony, ID

Well Derric, you're in luck. Tamiya has released an updated version of the Bruiser; it's marketed under the name "Mountaineer." It's basically the same as the Bruiser. Check out Stan Van Druff's review in our July issue. Stay tuned! JH

BATTERY BAFFLEMENT

What do SCR, SCE and SC stand for? This has been bothering me for more than two years, and no one seems to know the answer.

C.J. HANSON
Lancaster, CA

Sorry to break it to you, C.J., but those initials just designate the type of battery; they don't actually stand for anything cool. Sort of like the Traxxas TRX-1, or perhaps Associated's RC10T. See what I mean? But if you want to be really cool, make up your own acronyms like S-uper C-ell E-xtreme, or S-appy C-retinous R-odentia, or maybe even S-tupendous C-ornucopia. Get the idea? JH

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SCOPING OUT

HITEC SP-520

by JOHN RIST

RACING-STYLE SPEED controllers (forward-only with brake) are fine if you race. Many R/C car drivers, however, aren't interested in the heartburn of racing, but prefer to have fun burning up the backyard, school parking lot, or any hard, flat area that's close to home. The cars driven by this fun-seeking crop of drivers range from those with unpainted clear bodies that have been decorated with decals and magic markers to scale works of art fit for display in Talladega—Alabama's Stock Car Hall of Fame. By and large, this group of drivers is looking for the realism and fun that a reversing speed controller lends to their creation.

Knowing all this, I was excited when I received Hitec's latest offering—a reasonably priced reversing electronic speed controller (ESC). The Hitec SP-520 is a hobby-class controller with the following features.

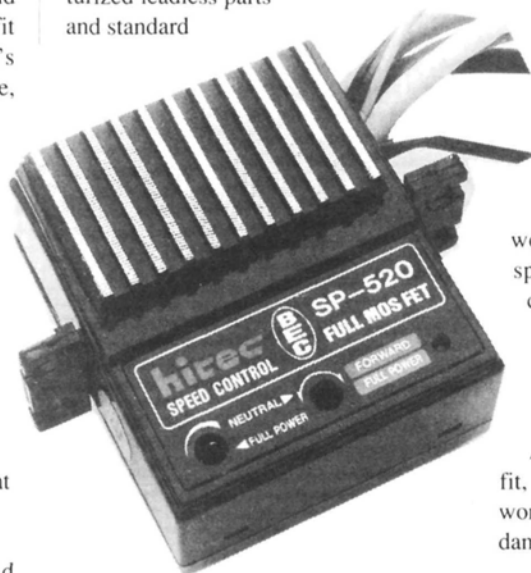
- reverse
- 12 FETs to handle the current (eight forward, four reverse)
- BEC
- two adjustment pots—neutral and full speed
- servo-style mounting ears make it easy to install and to remove
- Tamiya-style battery and bullet-style motor connectors
- automatic thermal shutdown
- built-in, two-color, pulse-checking LED
- instruction sheet and screwdriver.

I removed the Hitec SP-520 from its case to look inside. The case is made of plastic, interlocking halves (no screws), that are difficult to open without damaging. If you run in dirt, it pays to dump the dirt out of your receiver and speed controller occasionally. I've seen cars with a severe glitching problem that was caused by dirt in the receiver.

You can remove the bottom half of

the case by gently inserting an X-Acto knife blade under the lip of the top half and releasing the locking tabs. If you open the ESC, be careful not to break any of the small wires (receiver pigtail and switch-wiring harness).

With the SP-520's innards removed, I inspected the workmanship. Its construction is quite conventional; it sports a mixture of microminaturized leadless parts and standard



integrated circuits and FETs. All of the solder joints looked good, but there was a lot of solder flux on some parts of the board. The controller looks good inside; it should survive a fair amount of rough-and-tumble car action.

To reassemble the SP-520, I put the inside assembly into the bottom half of the case (making sure that all of the wires were routed through the wire exit area) and then snapped on the top half.

The Hitec SP-520 was now ready for bench-testing in the "Scoping Out" lab. Before I connected the controller, I read the instruction sheet, which is quite skimpy, but does answer most of the questions that might arise during

setup. The factory-installed motor and battery connectors make it difficult to plug in the controller incorrectly. If you're a newcomer to the wonderful world of ESCs, consider soliciting the help of an experienced friend or a hobby-shop owner.

A few words of caution: the receiver plug is a universal connector. This means that on one edge, it doesn't have the little plastic lip, so it fits several brands of receivers, such as Futaba KO and Hitec. The bad news is that you can put this plug in backward. If you do, it probably won't hurt anything, but the controller won't work. When you plug in the speed controller, look at the color-coding of the steering servo lead and make sure that the colors of the ESC's wire are identical. The combination that will *not* work is a Futaba-style plug in an Airtronics receiver. The plug might fit, but the pin pattern is wrong, so it won't work, and it could possibly do damage.

VOLTAGE-DROP TEST

Having sorted through all this, I had the Hitec SP-520 operating on my test bench. With 12 amps of current flowing, I measured the voltage drop along the full length of the wires, and found it to be 0.54 volt—an "on" resistance of 0.045 ohm—about average for a reversing speed controller. Next, at 2 inches along the wire, the voltage drop, with 12 amps flowing, was 0.31 volt—a resistance of 0.025 ohm.

This resistance wouldn't be acceptable in world-class racing circles, but it's quite good for a sport controller. Looking at the two sets of numbers, I saw that nearly half the ESC's resistance came from its having long wires and Tamiya-style connectors. You can improve this controller's

"SCOPING OUT" LAB AND TESTS

THE LAB consists of:

- an oscilloscope
- a digital voltmeter
- a variable-load resistor bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors that can be switched on and off one at a time to vary the load between 0.6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent 0.01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

• VOLTAGE-DROP TESTS.

These are the first tests. It's virtually impossible to read an ESC's resistance directly, so I measure the voltage drop across it with the resistor bank set up for 12 amps of current. I then calculate the controller's "on" resistance by dividing the measured voltage drop by 12 amps. I take the voltage reading twice: along the full length of the battery and motor wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

• LET-IT-COOK TEST.

I adjust the resistor bank to pass 20 amps of current, then I jam the throttle wide open and let the ESC pump the 20 amps.

• DEAD-SHORT TEST.

With this test, I check whether the controller can survive the heavy current caused by a jammed gear or a fried motor. No one likes to have this kind of trouble and discover that his ESC has been destroyed, too.

HITEC SP-520

DIMENSIONS:

Height0.96 inch
Width (less servo ears) ...1.62 inches
Length (with heat sink) ...1.81 inches
Weight (with wires and heat sink) ...3 ounces

TUNING:

Access to controlsgood
Ease of adjustmentgood

PRICE:

Suggested retail\$89.95
WarrantyNone listed

ELECTRICAL: (Manufacturer's specs)

Max. voltage(10 cells) 12 volts
Min. voltage(5 cells) 6 volts

Max. current480 amps
Continuous current120 amps
Resistance0.0125 ohm

TEST PARAMETERS:

Voltage6 volts
Current12 amps

TEST RESULTS:

Voltage drop along length of wire
0.54 volt
Voltage drop 2 inches along wire
0.31 volt
Resistance to end of wire
0.045 ohm
Resistance 2 inches along wire
0.025 ohm
BEC voltage, 6-cell pack5.65 volts

COMMENTS:

The Hitec SP-520 overheated during lab testing, but the thermal shutdown circuit kicked in and prevented damage. During the road test, when the Hitec SP-520 had an ample flow of air over the heat sinks, the overheating problem seemed to be resolved. This reversing controller has a standard, servo-style case. It's an ideal replacement for a burned-out mechanical controller in a backyard burner. All you have to do is strip out the servo-switch/resistor combination that makes up the mechanical speed controller, and install the Hitec SP-520 in place of the servo (using the existing servo hardware). The instruction sheet is a little skimpy, but it has most of what's needed to install and operate this controller. Its main deficiency is the failure to mention the need for motor filter capacitors. Hitec is noted for producing reasonably priced, hard-working products, and I think that the Hitec SP-520 fits this reputation well.

performance if you shorten the wires and upgrade to "pro-quality" connectors. Just remember, installing new connectors requires good soldering skills, and it's important *not* to reverse any of the connections. A controller that has been connected incorrectly will be history.

LET-IT-COOK TEST

For this test, I run the controller with its heat sink in place, but I don't provide any cooling air from a fan. I fired up the Hitec SP-520 and set the load bank to draw 18 amps. About 7 minutes into the test, I burned my finger when I tried to touch the heat sink. As I was nursing my finger, the current went to zero. It appeared that the SP-520 had bitten the dust.

I disconnected the controller and let it cool to room temperature. I then reconnected the power, and the current jumped right back up to 18 amps. The automatic thermal cutoff circuit had

done its job; it protected the Hitec SP-520 from deliberate abuse.

DEAD-SHORT TEST

When I placed a jumper directly across the motor leads, the current jumped to 43 amps (the limit of my lab supply). After 1 minute, the Hitec SP-520 smelled and gave off smoke (probably burning flux). The controller once again went into thermal shutdown and protected itself from destruction. A cool-down period once again restored normal operation.

The Hitec SP-520 seems to have adequate built-in protection to prevent it from "evaporating" when it's subjected to a fair amount of abuse. Just remember that a Ni-Cd battery pack (6- or 7-cell) can deliver more than 100 amps into a true dead short. Only the best of the best (very expensive) ESCs can withstand 100 amps. Typically, the 100 to 300 (and even higher) current rating printed in the spec sheet refers to

the current that the FETs could handle if they were bolted to the hull of a battleship below the water line! The wires, the printed circuit board and the solder joints in an average controller put the safe current-handling capacity of most controllers in the 20A to 50A range. Anyway, just remember, if your pride and joy isn't running properly, stop and fix the problem before it becomes too big to fix.

ROAD TEST

My favorite part of any "Scoping Out" article is the road testing. To road-test the Hitec SP-520, I decided to mount it in my trusty Kyosho Sideways (with a 6-cell pack and a Slot Machine motor). The picture in the instruction sheet tells you everything you ever wanted to know about installing this controller. It will help you to get everything plugged into the right places, especially because all the leads have factory-installed connectors. When you buy the unit, make sure that its receiver connector matches your receiver. A couple of installation details that the instructions don't cover are the need for motor-noise-reducing capacitors and the optimum transmitter setup.

I always install three 0.1-microfarad capacitors on a motor—one from side to side across the brush hoods, and the other two from each brush hood to the case. Be careful when you solder them to the motor's case, because heat can damage motor magnets. To minimize heating, I clean a spot on the case with a little fine sandpaper, and I use a large, hot soldering iron. This way, you can get in, make a good-looking joint and get out before there's time for the motor's case to heat excessively.

On my Futaba radio, I set the throttle reversing switch in reverse and the throttle trim to the middle of its travel. If your car runs in reverse when you squeeze the trigger, make sure that the blue motor wire is connected to the negative side of the motor (-), and that the white wire is connected to the positive side of the motor (+ or red dot). If they are, you must then correct the problem by flipping the reversing switch on your transmitter instead of swapping the wires going to your motor.

With the Hitec SP-520 installed and adjusted, I charged up several battery packs and headed for some traffic-free pavement. From the very first squeeze of the trigger, it was apparent that this was a solid performer. Acceleration was brisk, and speeds were good. There's a built-in delay between for-

ward and reverse, and although it won't allow you to pop wheelies by slamming between reverse and forward, it *will* protect those expensive gears in your transmission. Reverse is much slower than forward, but it's just the ticket for backing up when the car is stuck nose-first against a curb.

The controller had overheated in the lab, so, in an attempt to solve this problem, I made sure that there was an ample amount of air flowing over the heat sink. I checked the SP-520 at the end of each run, and I the heat sink was barely warm. The extra air flow had solved the overheating problem.

CONCLUSION

The Hitec SP-520 is a hobby-class reversing ESC. It's housed in a case that resembles a standard-size servo, and it seems to be fairly bulletproof (automatic thermal shutdown).

The servo-style case (complete with servo ears) makes it a snap to use in place of the mechanical speed controllers that come in most backyard burners. It probably weighs less than the servo-switch/resistor combination that it replaces, and it's definitely a lot easier to install. The servo ears can be removed if they're in the way of a tight installation.

All the overheating problems during bench-testing vanished when I ran my car on a cool day with plenty of air flowing over the heat sink. If you over-gear in an attempt to squeeze out more speed than is practical for your car/battery/motor combination, the Hitec SP-520's automatic thermal shutdown works well. The controller should survive even if you smoke your motor.

Racing-style ESCs generally have much lower "on" resistance than hobby-class controllers with reverse. Therefore, if you're interested in the Hitec line of speed controllers, the SP-1840 would be best for racing (see "Scoping Out" in last month's issue of *R/C Car Action*). If, however, you're looking for a reasonably priced, trick electronic speed controller to replace the burnt-up mechanical speed controller in your backyard "fun" car, the Hitec SP-520 would be a great choice.

*Here's the address of the company featured in this article:

Hitec; distributed by RCD, 9419 Abraham Way, Santee, CA 92071.

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